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MR. J. WENTZ WILSON, mining engineer, has left for Battle Mountain, Nevada, to examine properties in that vicinity. During his absence, communications should be addressed to him there.

THERE has been a "break" in the English steel rail market, and our contemporaries are deploring the fact that rails have been selling f. o. b. at £4 per ton. They do not see much of a chance for an improvement when the capacity is so much in excess of the demand, and, as the only way out of the dilemma, speak of the more extended use of Bessemer steel for other purposes than for rails.

IN spite of the fact that business is so depressed, the demand for the services of engineers of ability and experience is apparently greater now than it has been for some time. Applications come to us in greater number than usual, while those who are seeking employment are few. During the past week, we hear of two instances in which lead smelters are wanted, and to-day comes to us an inquiry for a chemist of experience, capable of doing the work required in a metallurgical establishment, in this case a gold chlorination-works.

WE are pleased to note that the long and vigorous agitation of the use of pyrites for acid manufacture is bringing out good results. We understand that the Davis mine in Massachusetts, whose ore was referred to in our issue of May 5th, is now producing at the rate of 2000 tons a month, and is selling not only in the Eastern States, but also in Baltimore. The company controlling the mine is in a position to contract for large quantities, and is taking the wise measure of doing all it can to aid manufacturers in putting up suitable plants for burning and running them.

DURING the present year, coke has made startling inroads into the foundry trade of anthracite coal in the Eastern and Middle States, where formerly the best grades of Lehigh lump were used to melt the iron in cupolas for machinery and stove castings. Connellsville, Snow-Shoe, and other cokes are so extensively used that not more than one quarter or one fifth of the quantity of anthracite used years ago is consumed. The low price of the coke and the comparatively stiff figures for the anthracite have, of course, brought about this revolution. It is likely that the difference between the price of the two grades of fuel will not remain so great for any length of time ; but the new rival is undoubtedly in many respects better suited for the purpose, and it will be difficult to dislodge it.

JUDGE BLATCHFORD has recently rendered a decision in the case of the Gramme Electric Company against the Arnoux & Hochhausen Electrical Company, which is of great interest to foreign patentees or purchasers of foreign patent rights. The Gramme Company controls the patents for the well-known Gramme dynamo-electric machine, and brought an action for infringement against the defendants, who pleaded that, as the Gramme patent in Austria had lapsed in 1880, the American patent expired at the same time. Judge BLATCHFORD sustained their view, thus confirming the position he has repeatedly taken under similar circumstances on former occasions. There can be no doubt that this interpretation of our patent laws subjects to a good deal of hardship those innocent buyers of foreign patents who are unacquainted with the danger they run, and often have no control over the manner in which the patent is handled in other countries. It increases the difficulties which foreign patentees must encounter in placing their inventions on our market, and teaches those who undertake the risk and labor of introducing them after acquiring the rights, that they must guard their movements with the utmost caution.

THE Bureau of Statistics has just issued its bulletin for the month of June, thus completing the figures for the fiscal year. A comparison of the data of this period with the year preceding it is of considerable interest, because in many respects the early summer of 1882 marked the beginning of the period of depression and liquidation, which, let it be hoped, has passed its climax now. Turning first to our imports of iron and steel, we abstract the following table :

IMPORTS OF IRON AND STEEL.

	1883.	1882.
Pig-iron, net tons	485,634	555,570
Castings, net tons	1,834	1,627
Bar-iron, net tons	58,435	75,197
Boiler iron, net tons	30	342
Band, hoop, and scroll, net tons	5,877	1,747
Iron rails, net tons	5,853	91,104
Sheet-iron, net tons	11,717	10,652
Old scrap-iron, net tons	70,964	177,020
Anchors, cables, etc., net tons	1,165	1,760
Steel rails, net tons	126,377	240,024
Steel ingots, bars, sheets, and wire	$12,204,945	$13,341,052
Machinery	2,228,732	2,027,840
Fire-arms	1,453,225	1,498,910
Cutlery	2,113,065	1,959,973

With a few exceptions, in which the increase is insignificant, there has been a falling off in our purchases from foreign competitors. The heaviest item on the list remains steel in various forms, as ingots, rods, etc., and the new tariff leaves no hope that there will be an early reduction in the figures. Old iron, pig, rail, and bar have all fallen off materially, and a comparison of the calendar years 1882 and 1883 will, we know, show a further decline.

The re-exports of foreign iron and steel are comparatively unimportant, the only heavy item being steel rails, of which 36,433 tons were reshipped in 1883, against 22,301 tons in 1882, thus bringing the net imports in 1883 below 100,000 tons.

The exports of iron and steel of domestic manufacture cut a sorry figure, the only redeeming feature being the growth of the export trade in machinery, edge-tools, fire-arms, and railroad stock, much of which, of course, went to Mexico. The following table gives the figures :

EXPORTS OF IRON AND STEEL.

	1883.	1882.
Pig-iron	$140,427	$194,411
Bar-iron	69,278	41,820
Iron rails	10,291	142,122
Castings	299,830	377,997
Car-wheels	184,614	118,195
Stoves	239,222	184,408
Locomotives	2,219,081	1,455,717
Stationary engines	191,208	111,199
Boilers	226,977	146,322
Machinery	6,223,029	5,525,948
Nails and spikes	354,065	335,820
All other manufactures of iron	5,918,610	6,084,365
Cutlery	102,100	92,031
Edge-tools	1,203,971	1,023,276
Fire-arms	1,097,934	907,957

The movement in metals has undergone considerable change during the year:

IMPORTS OF METALS.	1883.	1882.
Tin, cwts.	237,814	186,616
Copper ore, cwts.	527,394	163,819
" " value	$122,536	$157,708
Pig copper, lbs.	323,987	744,566
Manufactures of copper	$236,719	$315,475
Lead, net tons	2,751	3,777
Spelter, net tons	8,662	9,214
Sheet-zinc, net tons	1,650	2,132

It will be noticed that there has been a very large increase in the imports of tin; and this is rendered more striking when it is stated that the re-exports were only 1177 cwts. in 1883, against 23,144 cwts. in 1882, thus making the net supply 226,537 cwts. in 1883, against 163,472 cwts. in 1882. The imports of copper are insignificant, while ore, though increasing heavily in quantity, owing to the imports chiefly of Canadian pyrites, fell off a little in value. Spelter and sheet-zinc exhibit a falling off in the beginning of this year. The movement has now practically ceased, owing to the exceedingly low prices of the domestic article.

As the following table will show, our exports of metals have been satisfactory chiefly as regards copper:

EXPORTS OF METALS.	1883.	1882.
Copper ore, cwts.	112,923	25,936
" " value	$943,771	$89,515
Pig and old copper, lbs.	8,221,363	3,340,531
" " value	$1,293,947	$565,295
Manufactures of copper	$110,286	$93,646
" " brass	$287,847	$322,439
Sheet and pig-zinc, tons	426	750

It will be noticed that the value of the ore shipped abroad has increased more than ten-fold, and considering that the heavy export has begun only during the past few months, June alone being credited with $206,602, it will be understood that at the end of the year a very respectable tota will be reached. It must be a source of regret to all who have the growth of our home industries at heart to see upward of two millions of raw material leave the country to be manufactured elsewhere and distributed over the world, while we, with a plant unrivaled anywhere, and with superior skill in manipulating and shaping the metal into graceful forms, can not command a market for more than a fraction of the finished articles. Our miners have proved their ability to compete with any producing country in the world. The time has now come for our manufacturers to prove that they are able and willing to do their share.

GLASS FROM GRANULITE.

The manufacture of "pale metal" glass from the rock known as granulite has been carried on successfully by F. SIEMENS at Dresden, Saxony, and at Elbogen, Bohemia. The superiority of the glass and the great economy of production have secured to him a very large share of the bottle trade of the continent; the output of his works during the year 1880 having been about twenty-two millions of bottles, which has since nearly doubled in number annually.

It is now proposed to establish works in England to manufacture glass extensively from a deposit of granulite which has been discovered at Meldon, Devonshire, and using the Siemens process. Mr. SIEMENS, to whom a sample was sent, wrote approvingly of the quality as follows: "The small piece of granulite seems every thing we could wish for. If that kind of stone is to be found in large quantities, and of a uniform character, and easily to be got, it might prove quite a treasure, as it consists almost exclusively of silica and alkaline matter, with perhaps 15 per cent of alumina and but little iron."

These are the essential qualities of granulite for glass-making. The rock is generally classed as a member of the granite family. It consists mainly of quartz and orthoclase feldspar, and is either granular or schistose. It is sufficiently rich in the alkalies to fuse and to make a pale green glass, if a little lime is added sufficient to secure a perfect fusion of the quartz. The rock is nearly white, and in fact is known by the Germans as *Weiss-stein*. It should not contain much iron; the Saxon variety does not contain over 0·71 per cent. Similar rock, or rock which would serve equally well for the manufacture of glass, is found in Canada and in California, and probably in New England.

The economy in the use of the rock over the use of the ordinary sand and alkali is shown by Mr. SIEMENS, who states that, at his works in Dresden, the batch for ordinary green glass with granulite costs 8d. per hundredweight, and gives 93 per cent of glass; while the batch with sand costs 13d. per hundredweight, and yields only 67 per cent of glass; consequently glass from granulite costs only 8¼d. per hundredweight, while that from the sand batch costs nearly 20d. or more than double, if calculated upon the glass. There are, besides, advantages in favor of the granulite in respect of fuel, labor, and wear and tear of furnaces.

In the prospectus of the English company, it is stated that the deposit at Meldon has been examined by W. F. RUTLEY, F.G.S., who finds it to be in quantities sufficient to supply any likely demand for glass manufacture in England for the next thirty years. It is proposed to put up the works at Swansea, and to connect the quarry at Meldon by a siding with the London and Southwestern railroad system by which the granulite will be taken to the port of Fremington, to be sent thence by water at small cost to the works at Swansea. The advantages of this location rest in cheap coal, limestone, and labor, with works already built, excepting SIEMENS'S continuous melting-tanks, which are to be added, a license having been obtained from Sir WILLIAM SIEMENS. The company proposes to make, not only bottles in large numbers, but glass castings, as substitutes for woods and metals. Among other articles, millstones, gas and water-pipes, and even railroad ties are enumerated.

These facts should stimulate a search in this country to determine whether deposits of magnitude of suitable granulite are favorably located for transportation to make their development practicable and profitable.

FROM HANCOCK TO ONTONAGON.

Special Correspondence of the Engineering and Mining Journal.

The superabundance of water, this year, has been helpful to many of the copper mines. The Allouez, Peninsula, and Wolverine have been especially benefited, although the first and last could hardly be said to be in want before. However, the Allouez, to do the work of the future, stands in need, quite possibly, of more water than has been available during the past few years. This mine had its regular set-back about the middle of July, by a fire in the stamp-mill, which threatened to prove a serious catastrophe. The blaze was quickly extinguished, and, excepting some incidental damages to the roof, the mill escaped without any injury. The record of the Allouez for June and July is the most satisfactory for years. The showing of mineral for June, nearly 112 tons, was the largest in the history of the mine, and, as I am informed from most trustworthy sources, was produced with an ease hitherto unknown. No. 3 shaft is in copper ground, and is able to take its share of hoisting other cupriferous ground which has formerly been done solely by No. 2. This makes the burden of No. 2 much lighter, or at any rate much more profitable. By economical and skillful handling, the mine is able to send more rock down to the stamps, and at distinctly less prices than ever before. This will be good news for the patient friends of the Allouez, and is thoroughly reliable. This mine has long been under a cloud, and has equally long deserved better than it has had. The ground is lean, scarcely ever at all fat, and very hard withal; the lode is very wide, the copper in small particles, and much has to be done for little; but its present facilities for work are very excellent; its hoisting and crushing plants are very complete; it has a new locomotive, and were its stamp building a little more steady, it would have nothing—except copper—to be desired. The Allouez is promising, though in fairness it ought to be said not immediately flattering. It has enough water at the stamps for twice as many heads, and can now do work for all there is in it. Its neighbor, the Wolverine, seems to be going higher in public estimation as it goes deeper into its well-charged lode, although the real value of the lode is yet a matter of hypothesis. It is publicly stated that this mine can produce copper at 10 cents per pound. But this must be taken *cum grano salis:* it may reach such a figure for a few days, or even a few months; but such a rumor must not be taken as any probable basis for calculating the future of the property. The output for July, however, was in excess of the Peninsula by about 31,000 pounds—a very creditable showing, indeed, although the aggregate for 1883 falls below the Peninsula by some 130,000 pounds. The Peninsula is putting in a new head of Ball stamps, and, with the additional capacity which this will insure, will push its way steadily to the front of the smaller mines. It is spending money quite freely in proving up the various unexplored belts which cover its property, but is more than paying its way, I understand, from the proceeds of the old conglomerate beds. The history of the Peninsula before its re-christening—say from 1865 to 1869—would be a profitable text-book for the directors of at least one other Lake Superior copper mine to study. The old Boston & Albany was ruined by excessive surface expenditure before the value of the beds had been thoroughly proved up, and a warrant for the outlay found in the tangible resources of the copper belt. In this, too, the Wolverine furnishes a good illustration of legitimate development, increasing its plant as it has found reason for such action in the actual showing of the mine.

The Calumet & Hecla is putting in a new hoisting-plant at the Calumet end, thus holding its jumbo as a canvass-backed curiosity, and introducing a horizontal Corliss to do the work for which the jumbo was originally designed. Improvements are also making at the Hecla engine-house, which connects with the hoisting and compressing machinery. The electric lights from each of the two poles are said to be visible from the decks of steamers shortly after clearing from Duluth. It is wrong to say that the Calumet & Hecla intends swamping the other mines when its new Leavitt stamps are ready for action. These powerful heads are put in to economize and facilitate the milling of the rock; and it is probable that this gigantic property, conscious of its ability to crush the backbone of its humble neighbors, if it comes to a case of dog eat dog, will pass them by as the larger Spanish mines do their modest competitors, content with its lion's share, and allowing each dog to have his bone. Of course, if the Western mines infringe too much, it may put in a rejoinder by way of an unprecedented output and unprecedented economy in the management at this end of the property; but for the present, at least, these are both improbable and irrelevant. Few corporations pay such wages as the Calumet & Hecla. Indeed, the wages question forms no stumbling-block at all in the path of the mine to the very highest financial success. The enormous reserves of the company do not make economy either in wages or construction essential to its annual dividends of $2,000,000, and it can not be truthfully said that economy is to any appreciable degree practiced. The stockholders do not seem to put in any disclaimer, although a very respectable company of speculators left it, not long since, to put their funds into telephone stock as being more remunerative and no less sure. But in the other mines, the wages fund cuts a very important figure, although by no means as important as before the introduction of power drills and compressed air. The relation of the construction account to the year's expenditures was at least casually presented in a former letter. The wages question has regulated itself, and needs now to be referred to

only as a matter of history. There has been a general reduction through the Houghton and Keweenaw mines of about twelve and a half per cent, although in several instances, where wages were already at hard pan, it falls somewhat short of this. A reduction in wages in Ontonagon would have been impossible, unless the miners had turned farmers, and I learn of no very considerable falling off in the year's expenditures in that quarter. It ought to be remarked, in passing, that the question of explosives is now one of importance approximating to that of wages. There is some incoherent talk of a combination among the mines to manufacture their own giant powder on the co-operative plan, and thus reduce the prices at which it is now maintained by powerful monopolies. A reduction in the cost of explosives, together with the reduction in coals which has already set in, would lift a burden from the mines, which, though so far not intolerable, is very embarrassing, and help them to undertake the future mining of copper on a basis of competition in the markets of Europe.

The Tamarack, which, you will remember, is making a vertical plunge of something over 2000 feet after the Calumet & Hecla conglomerate, is going steadily on downward to its prize; a little slowly of late, averaging not quite thirteen feet, but now again at its old pace of from fifteen to seventeen feet per week. It has already passed through several more or less heavily charged copper belts, at least one of which is worth working. The Allouez lode, which some were expecting would be struck very rich in the Tamarack, was passed at something over a hundred fathoms, but was pinched out to a mere sandwich. At the present rate of descent, the shaft will be half-way down by the close of the year; and in another year and a half, the Calumet & Hecla conglomerate will be tapped and the work of developing the property begun. There are some outsiders who still regard the scheme as chimerical; but the cost and the rate of descent have thus far been much within the estimates upon which the experiment was inaugurated. I am told that the ventilation thus far could not be improved, and, barring out the death of a Finlander who fell into the shaft several months ago, no accident has occurred on the property. The mine makes little water—none at all, I believe, after the first three hundred feet. Apropos of the Tamarack, it will be interesting to the readers of the ENGINEERING AND MINING JOURNAL to know that a cross-cut driven in the Osceola (in whose office reposes the management of the Tamarack) has opened up a belt which, under a test process of drifting, has furnished a considerable quantity of barrel and stamp copper, although the extent and value of the find are not as yet known—at least to me. The Osceola is laying the foundations for a new head of Ball stamps at its mill in Hancock, and will soon materially increase its output, which is already in excess of last year.

Very little is doing at the Phœnix, although the fabled bird is far from giving up the ghost. A party of virtual tributers, at the head of which is Hon. Charles Briggs, of Calumet, has the mine in hand for liquidating indebtedness. The mine is said to have produced over 450,000 pounds thus far in 1883; and if the output had continued uniform until the winter holidays, it would have reached a higher figure than any year since 1877. Doubtless, the mine would have continued to work more or less strong if the prices of January had been maintained; but the Phœnix has, for the present at least, been compelled to succumb under the pressure of an export market. It is said by trustworthy persons that better days are in store for the Phœnix; but it is hard work to recuperate after an onslaught of tributers has been made on the galleries of a mine, since tributers raise their funds as Indians do their trophies, by scalping their victims. The Phœnix has had an eventful history, and all who are acquainted with the history of Lake Superior mining will wish this old and finely situated property a future as remunerative as its past has been discouraging and disastrous. Its distant neighbor, the Copper Falls, has been selling at Boston for twenty-five cents; but there were no reports to your correspondent of Keweenaw people loading up very heavily even at that nominal rate. The mine makes a showing of mineral, however, which outstrips the Huron, Wolverine, Grand Portage, Hancock, and Phœnix, reaching, up to August, an aggregate of nearly 600,000 pounds. The cost of production is not high at Copper Falls; and if the yield were uniform, mining could be carried on at a comfortable profit. Your correspondent did this property a trivial but inadvertent injustice last June, by saying that the mine was about to put in a new head of stamps. The mine has two very fine heads of Ball's stamps, with an aggregate capacity of about 300 tons of rock per day. But one, however, has been running since early in 1881; the other is now at work also. Your correspondent makes this correction unsought and heartily, the mistake being a *lapsus calami*. The surface work at the Conglomerate is progressing at its usual pace and volume, but to what purpose must be shown by the sequel.

Over in Ontonagon, which is wonderfully beautiful and picturesque at this season of the year, the Nonesuch was practically idle when these notes were first written, but is now starting into life again. An Eastern syndicate was up while your correspondent was doing the copper country, and arranged to begin active operations at once. The Mass mine at that time had recently discharged forty miners, and was making no effort to keep the mine open ahead. Captain Chynoweth, the agent, then East, endeavoring to persuade the directors to open at least some small reserves, has since returned with instructions to carry on his stopes, but to do no sinking. Several antagonists of the belt scheme use the comparative failure of the Mass as a war-club for thumping the undertaking of our British cousins, since the Mass is sinking the Knowlton vein, the only thing in the belt system of which any thing at all is known. But this is unfair, since the action of the Mass people shows not necessarily that the Knowlton vein is too poor to pay (though it may be a very pungent hint in that direction), but that the Mass people are not willing to hand in enough contributions to attack the beds after the manner of the Pewabic, Osceola, and Allouez. I learn indirectly from England that the Belt stock is not finding much public favor, although I doubt not those who have gone into the enterprise will see it through. The machinery for the stamps is already landing at Ontonagon, and by the time it is *in situ* will have more or less copper to set it pounding. In case the Belt should prove a *fiasco*, it can never be charged against the integrity of American miners; for no disinterested miner was ever asked his opinion of the property. However, time will decide in emphatic tones whether our English relatives have paid too dearly for their whistle.

SPECULAR.

NOTES ON THE EXHIBITION AT DENVER.

Special Correspondence of the Engineering and Mining Journal.

The exhibition was opened this year on the 17th of July, when an address was delivered by Senator H. Miller. The exhibits were, as usual, tardily placed, and it was some time before all was in good trim. Though some counties which were here last year are conspicuous by their absence, the display is, on the whole, very good, and only needs an appreciative public. More space has been provided this year for machinery, but, though taken, has not been entirely filled.

The Lake County exhibit, as representing the richest district in Colorado, ought to be the first described; indeed, it is the first to attract attention, being very properly placed in front of the entrance to the exhibition building. Its value is very much enhanced by two large geological maps of the Mosquito range, lately issued by the U. S. Geological Survey. It would be well for each county and district to copy this plan in the future.

The case which is set apart for the exhibit of the Chrysolite mine is the most complete in this section, and is well worth careful study. It is divided into three sections, having in the center a splendidly executed plan of the mine by Mr. Howard Platt, a very expert draftsman. This plan shows the different properties belonging to the company and their contours. The properties consist of about ten claims. There are also five geological sections, very interesting as showing the replacement of the limestone by the ore-bodies, and also the points where the gray porphyry dikes have cut through all the separate formations into the ore-body. These sections also show very plainly that puzzling phenomenon, very characteristic of this mine, where bodies of limestone lie separated from the beds in irregular masses, much replaced by ore and surrounded on every side by porphyry. The different formations cut through by the gray porphyry dikes are the white porphyry, Cambrian quartzite, Silurian limestone, parting quartzite, and Carboniferous limestone. What are called the second and third iron deposits lying in the limestone are shown, from which some rich ore has been taken. The whole country of the mine is made up of masses of white porphyry. In the cases are, first, specimens of block porphyry, dike porphyry, nodules of dolomite, dolomite sand, quartzite, limestones, etc. Secondly, curious specimens of iron chert; galena from the second iron deposit, in the Carboniferous limestone, and containing 120 ounces of silver per ton; galena from the third iron deposit, in the Silurian limestone, from which deposit some rich ore has lately been taken. Thirdly, rich galenas, containing, in some cases, over 400 ounces per ton; silver lead ores associated with barytes; carbonates of lead and silver containing from 100 to 300 ounces of silver per ton, and from 40 to 60 per cent of lead; sand carbonates containing from 1000 to 2000 ounces of silver per ton; and a specimen of chloride assaying about 5000 ounces of silver per ton, and 40 per cent of lead. There is also a photograph of the mine buildings and neighborhood.

The Silver Cord mine has also a wonderful and splendid mineralogical display. Among the most notable are some specimens of concretionary calcite, some of the concretions measuring three inches across, and being beautifully radiated. This mine shows many splendid specimens of that very rich silver ore embolite, a bromo-chloride, two in particular, consisting of ochreous carbonates, speckled all over with fish-like scales of embolite and cerussite. One specimen of a carbonate of lead shows a remarkable structure resembling petrified wood. A curious specimen of oxide of iron is exhibited, having a botryoidal structure, resulting from the decomposition of a carbonate. There are some fine cut and polished specimens of kaolin, some colored with various minerals, and some colored with copper. Of the hard gray carbonate which forms the staple shipping ore, there is one block weighing a ton. Some beautiful dendrites, due to manganese, and some fine specimens of galena, hard carbonate, incrusted with chloride of silver, sulphato-carbonate of lead containing 103 ounces of silver per ton, help to make up a truly elegant exhibit. As curiosities also, there are specimens of malachite staining siliceous nodules in a sand carbonate, and specimens showing galena and carbonate of lead in contact.

The A. Y. mine shows some of the best specimens in the exhibit, a number of them consisting of highly crystallized pure carbonate of lead, though generally colored a rich brown by iron oxide. One or two in particular are rendered more beautiful still by fine foliated native silver being scattered over them. Some masses are composed of crystals more than an inch long. Some specimens show the lead crystals on brown iron oxide. Among the carbonates from this mine may be mentioned some specimens of an amorphous carbonate of lead, closely resembling the ordinary white-lead of commerce. There is a fine specimen of anglesite (sulphate of lead); also galena, containing from 5 ounces of silver per ton, and 70 per cent of lead. Some curious specimens are shown of galena laminated with iron pyrites and zinc-blende. There are some truly splendid specimens of galena covered with native wire-silver; also black sand carbonate, 60 per cent of lead, disintegrated iron pyrites crystallized in cubes and octahedrons, and galena associated with carbonate of lead. A specimen of limestone, showing the chemical action of water very plainly, has been taken from under the ore-deposit.

In this exhibit, there are also a number of splendid specimens from the celebrated Mike & Starr mine, consisting of galena, with iron and copper pyrites, carrying 520 ounces of silver and 15 per cent of copper, and a specimen of iron pyrites in gray porphyry, containing small quantities of lead, silver, and gold, which, according to many authorities, are representative of the original rock whence all the riches of this extraordinary region have been derived. Some vanadates of antimony are also exhibited.

The Robert Emmet mine shows carbonates containing 175 ounces of silver and 60 per cent lead. The Ready Cash is represented by free-milling ore containing 400 ounces of silver and 10 ounces of gold. Some nearly pure hematite ore is worth mention, in view of the late meeting at Denver to organize an iron smelting establishment.

The Yankee Doodle mine shows a number of good sand carbonates and ocher ore containing 556 ounces of silver per ton, and 61 per cent lead, and 202 ounces of silver per ton and 25 per cent lead respectively. This mine also shows some fine blocks of different colored hard carbonates with over 150 ounces of silver per ton, and specimens of a fine-

grained, peculiar quartz, etc., overlying the ocher ore. The Henriett mine exhibits sand carbonates with galena, 90 ounces of silver per ton, and crystallized galena and lead carbonate assaying 100 ounces of silver per ton. Also, a grand block of galena, showing the passage into carbonate, fine-grained galena showing curious action of water, and a block of hard carbonate containing large rhombic crystals of cerussite.

Specimens from the Carbonate mine are distinguished by nearly all showing a quantity of embolite on their surfaces. Those worthy of special mention are a breccia of limonite and other oxides of iron covered with the above-named mineral, and a carbonate also showing embolite. The ores shown for this mine run about 400 ounces of silver per ton.

The Iron Silver mines show an interesting series of different-colored sand carbonates in bottles running from four up to 710 ounces of silver per ton; a curious and fine specimen of calcite in calcareous limonite; specimens of native sulphur; and large blocks of rich hard carbonates and galena, showing that the ore exists in large masses. Dendrites and leadhillite are also noteworthy.

Little Pittsburg mine shows galena running from 90 to 800 ounces of silver per ton; and Little Chief mine hard carbonates and galena with embolite assaying from 90 to 500 ounces of silver per ton. The Long & Derry mine is represented by some rich ore with chloride of silver; the Dunkin and Wolfe Tone mines by rich galena; and the Cyclops mine by rich carbonate ore with sulphuret of silver up to 1100 ounces per ton. The Harrison Reduction-Works exhibit samples of matte, speiss, and materials for reducing ores. There is some gold ore from the Double Decker mine, containing 35 ounces of silver per ton; also some horn-silver from the Big Pittsburg, azurite from the Highland Chief, and a beautiful specimen of chalcedony on amethystine quartz. The Matchless mine shows, generally speaking, the richest collection of ore in the Lake County exhibit, although mineralogically poor. It consists chiefly of hard carbonates in immense blocks, and showing, in many cases, embolite, and of a peculiar argillaceous ore which, when taken out of the mine, is in a wet and plastic condition. One specimen of this ore (a black variety) is made up into a large square brick. Its richness is sometimes very great, one sample assaying 2750 ounces of silver per ton. Many others assay over 1000 ounces of silver per ton. There are also some fine large pieces of horn-silver, assaying about 23,000 ounces of silver per ton; and a curious block of flint, interesting as showing the probable presence of thermal waters during the deposition of the ore.

The Robert E. Lee has a few very rich samples of hard and sand carbonates, but nothing very striking. The commissioner for Lake County, Mr. N. H. R. Read, who kindly furnished me with all particulars, has compiled the following list of the production of that region up to July 1st, 1882, which may be of interest as showing the rapid development of the Leadville camp during the last few years:

Yield from 1860 to 1873, gold from placers	$6,400,000
Yield from 1874 to 1875, gold and silver	258,000
Yield for 1876, gold, silver, and lead	85,000
Yield for 1877, gold, silver, and lead	555,000
Yield for 1878, gold, silver, and lead	3,153,000
Yield for 1879, gold, silver, and lead	10,333,000
Yield for 1880, gold, silver, and lead	14,187,000
Yield for 1881, gold, silver, and lead	13,170,000
January 1st to July 1st, 1882	7,817,000

The Colorado Machinery Company has one of the best exhibits in the mining machinery department. It exhibits the celebrated Deane pumps in motion, one capable of delivering 150 gallons per minute; also a large and good assortment of tubes and pipes for various purposes from the National Tube-Works Company, Chicago; a new fan blast ventilator by the Chicago Ventilating Company; patent noiseless exhaust fans by the Boston Blower Company; patent pulverizers and an Embrey concentrator by Stephen P. M. Tasker, of Philadelphia, Pa. There are also mine supplies in the shape of tubs, mine cars, slag-barrows, Fairbanks scales, etc., and a model of Huson's patent endless wire rope tramway.

Among notable new things exhibited this year none is more deserving of notice than a new drill called the Randall chamber drill. This is one of the newest "notions" of the West, as it is also likely to prove one of the most useful. It has borne the test of hard work with credit. The inventor, Mr. Randall, of Pueblo, claims in his specification that it is an improvement on the chamber drill patented by E. J. Williams, in 1879. His object is, to quote his own words, "to provide an improved means for enlarging the diameter of a drill-hole at the bottom thereof." The cutting-bit is fitted to the drill-stock by a strongly made tenon, which fits into a recess in the stock provided with a knuckle or ears, being held there by a pin passing through both. It is so made that the force of the blow is received by beveled shoulders on each, situated at the front and back of the drill. It is claimed that the blow is distributed or conveyed more nearly to the center or axial line of the drill-stock than in any other drill now constructed for the same purpose. When the drill enters the drill-hole, the bit is on a line parallel with the drill-stock; but in practice, it is at an inward angle of about 30 degrees, and cuts outwardly as the drill-stock is rotated, thus quickly cutting out a chamber at the bottom of the drill-hole. The peculiar construction of the curved end of the cutting-bit materially assists its operation. I hope to say something as to the other exhibits in another number.

A. COPELAND.

August 23, 1883.

A TUNNEL UNDER AN IRON MILL.—The last stroke of work on the big tunnel, 1650 feet long, under Jones & Laughlin's Iron-Works, Pittsburg, has been completed. The tunnel was constructed by the Vanderbilt Pittsburg, McKeesport & Youghiogheny Railroad. Its cost will be $500,000. Over six hundred men were employed on it for a year. The tunnel is one of the engineering feats of the day. The roof is only a few feet below the top of the mill floor, where massive rolls, hammers, and hundreds of men were working. The mill is the largest single mill in the United States, and none of the buildings was injured, and work was not delayed an hour. The ground through which the tunnel passes was mill cinder and slag. For over one hundred feet the slag was so hard it could not be blasted. Heavy weights were dropped on it, and the broken pieces buried in holes where they fell, as they could not be moved, the masses were so large. The road opened for a distance of sixty miles on Sunday for freight traffic.

THE GATES PULVERIZER.

We have repeatedly referred to the movement now in progress in milling circles, to crush ore that must be roasted previous to leaching or amalgamation, in favor of rolls as a substitute for stamps. We need not, therefore, rehearse the points which favor the substitution of one class of machinery, and propose simply to call attention to the latest design, brought forward by Messrs. Charles Kaestner & Co., of Chicago, which we illustrate in the accompanying drawings.

As shown in the section and side elevations, the pulverizing mechanism consists of two sets of rolls *D*, placed one above the other, and driven by a single outside gear-wheel on the pulley-shaft. After having been brought down to a suitable size in ordinary crushers, the material to be pulverized is put into a double hopper, from which it is distributed by a simple self-feeding arrangement, shown in the drawing, to the upper set of rolls. Passing through these, it drops on the table shown in the section, and is delivered to the lower set of rolls, by which the bulk of it is reduced to the desired size. Within certain limits, the distance between the individual rolls of a set may be regulated by placing flat pieces of steel between the journal-boxes. The tension on the springs forcing the rolls toward one another, may be regulated by the screws shown in the elevation. The wearing surfaces of the rolls themselves are shells of chilled Franklinite iron, which are held in place by bolts. The material dropping through the lower set of rolls falls upon a revolving screw having elevator buckets on the inside, within an inch of its surface. That portion of the material which does not pass through the screen accumulates with the finer material until the buckets are able to scoop it up and return it to the top set of rolls. The screen is driven by chain from the main shaft and runs on the friction-rollers *B B*. The entire crushing mechanism is inclosed in a casing, the journals, however, being placed out of the reach of dust. We have had occasion to examine the workmanship of the pulverizer at the establishment of Messrs. Kaestner & Co., and noted that it was substantially and well built.

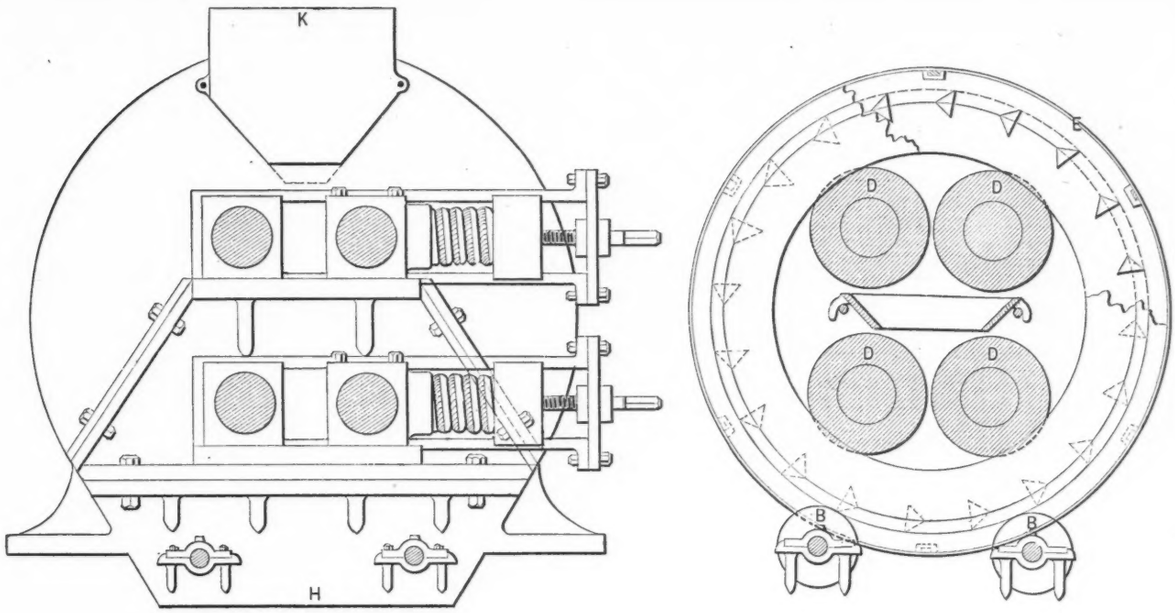
One of the principal objects of the design, aside from that of reducing a maximum of material to the desired size with a minimum of wear and expenditure of power, has evidently been to render the machine compact, and to do away with separate screening and the nuisances of dust and attendant losses. The pulverizer is now in use at the mill of the Portland Consolidated Mining Company, Deadwood, D. T., and the Northwestern Terra Cotta Works, Chicago. We shall soon be in a position to report on its performance at the former establishment.

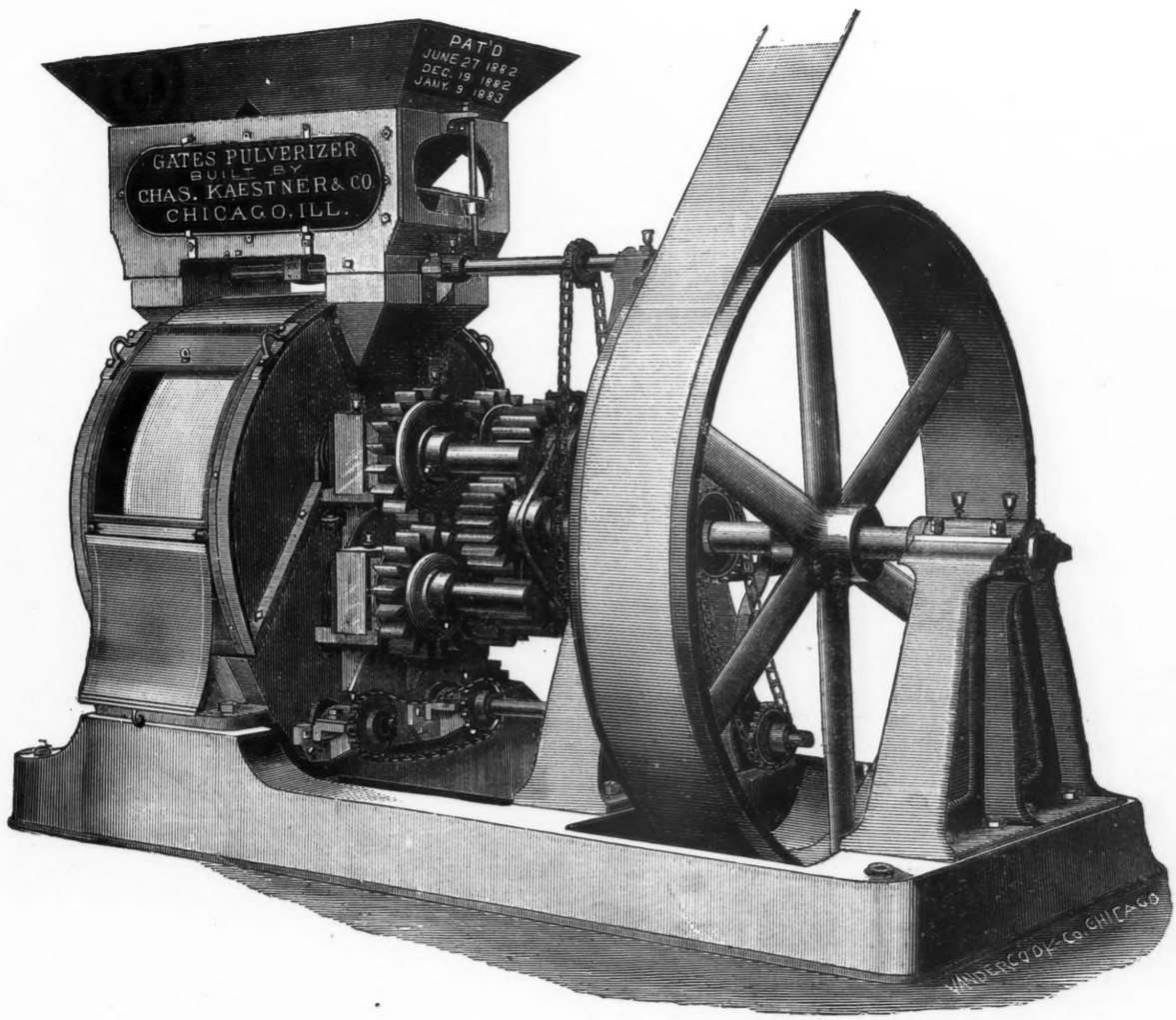
SPLICING THE BROOKLYN BRIDGE CABLE ROAD ROPE.

Recently the rope of the Brooklyn Bridge cable road, which is now nearly ready for regular business, was spliced. The rope is 11,600 feet long, or about two miles. Its weight is 31 pounds per foot, which gives it 35,900 pounds for a total weight. The diameter is 1½ inches, and it has a breaking strength of 50 net tons. The center of it consists of a tarred hempen rope or cord; around the center six strands of wire are coiled, and each strand consists of 19 wires, so that the cable consists of 114 wires, compactly and stoutly wound spirally about a hempen center. The most particular part of the work of rigging this traction cable was uniting the ends so as to make it endless. The cable was furnished by the Roebling wire factory, and when the work of laying it reached the point where splicing was necessary, application was made to the factory for a man skilled in splicing. The best man that could be had was asked for. The best man was at the time in California, whither he had gone to splice some cables for the Cable Street Railroad Company of that city. Engineer Martin was looking about for some other splicer when he learned that the man who had gone to California was on his way back. By waiting forty-eight hours, the man that he wanted was secured.

The splicing of such a cable, as has been remarked, is a pretty nice piece of business. It has been performed on the bridge cable so neatly, that no one can discover where the two ends come together. In order to keep watch of the spliced parts, they have been painted white. The white place is 160 feet long. As nearly as the process of splicing can be described here, it was done in this way: The ends of the cables were drawn 80 feet each way from the point where they met—that is, they were lapped that distance. Then one of the six strands was uncoiled for the distance of 80 feet. Another strand was uncoiled for 68 feet, another for 56 feet, and so on for the whole six, each being 12 feet shorter than the other. This process was observed on both ends of the cable. Then the strands thus "shingled" were intertwined so as to restore the size and shape of the original cable. In order to accomplish this, the hempen core of the original had to be taken out by winding it outward along the trend of the original twist. As each strand of one end was laid about its companions of the other end, its extremity was ingeniously pressed in toward the center from which the hempen core had been removed, so that it is not seen, nor can it be found except by the closest tracing. To all appearance, the cable was made endless at the factory. The engineers of the bridge have been very much interested in the work of making the splice, they having never before witnessed a like operation.

THE DUTY ON CHARCOAL IRON.—A letter was received at the Treasury Department on the 24th from the Champion Horsenail Company, of Appleton, Wis., protesting in strong terms against such a construction of the tariff law as shall preclude from the privilege of entry at the rate of $22 per ton all charcoal iron irrespective of shape or size. This letter is the first one brought out by Acting Secretary French's letter of the 17th inst. to Secretary Swank, of the Iron and Steel Association. In that letter, the acting secretary said the Department was inclined to hold that the concluding proviso of paragraph 148, regulating the duty on charcoal iron, applied only to the kinds of iron mentioned in the paragraph, and not to round iron in coils or rods, or to iron rivet, screw, nail, and fence wire rods in coils or loops, when manufactured by the use of charcoal. It appears probable that the department will hold that, if an importer declares that the wire rod brought in by him is, to quote the letter, "intended for or adapted to the manufacture of rivets, screws, nails or fence wire," it must be admitted upon payment of a duty of $\frac{8}{10}$ of 1 cent per pound, instead of $1\frac{2}{10}$ cents per pound. Once admitted, the iron may, of course, be used for any purpose to which it can be applied.





THE GATES PULVERIZER.

THE NICKEL PLATING PATENT.

The decision of the United States Court for the Southern District of New York, Judge Blatchford presiding, sustains once more, goes a little farther, and gives a still broader interpretation to the Adams patent than had been given at any previous trial. Judge Blatchford holds substantially that Adams was the first discoverer of a practical method for electro-plating with nickel, and his patent secures to him practically a broad monopoly of the art, and of all articles electro-plated with nickel. The patent in question was granted to Isaac Adams, Jr., August 3d, 1869, and the two principal claims read as follows:

1. The electro deposition of nickel by means of a solution of the double sulphate of nickel and ammonia, or a solution of the double chloride of nickel and ammonium, prepared and used in such a manner as to be free from the presence of potash, soda, alumina, lime, or nitric acid, or from any acid or alkaline reaction.

4. The electro-plating of metals with a coating of compact, coherent, tenacious, flexible nickel of sufficient thickness to protect the metal upon which the deposit is made from the action of corrosive agents with which the article may be brought in contact.

The defendant, Pendleton, obtained a patent September 28th, 1880, for what he claims as a new and entirely different mode of plating with nickel. His claims are as follows:

1. In the art of nickel plating, an acid solution of acetate of nickel, consisting of oxide of nickel and acetic acid, said solution having an excess of acid.

2. The method of making acid solutions of acetate of nickel, consisting in slowly digesting oxide of nickel and acetic acid with or without heat, so as to have an excess of acid in the solution, substantially as described.

The court held the Pendleton process to be merely the chemical equivalent of the Adams process, and accordingly gave judgment for Adams, with injunction and an account.

MECHANICAL PUDDLING.

By J. G. Danks.

My purpose in this paper is not to treat the science of puddling generally, but merely to sketch the history of mechanical puddling, the difficulties encountered, and the manner in which they have been overcome. It is necessary first to describe briefly the old or hand system of puddling, as it may assist in understanding the difficulties to be met in performing the work by machinery. Puddling is the process in most general use for converting cast into wrought-iron, by first melting and then agitating the metal while kept at a high temperature; in which operation it is deprived of its carbon, silicon, and other impurities.

The process was first introduced by Henry Cort, in England, in the year 1780. In partnership with Samuel Jellico, at Fontley, in Southampton, he worked out this problem, which was at that time the most important step ever taken toward increasing the quantity and reducing the cost of manufacturing iron.

The bottom and sides of the puddling-chamber in Cort's furnace were lined with sand; and as the removal of silicon is one of the chief objects of the puddling process, it will be readily seen that one of his worst enemies (sand) was present at all stages of the operation. Notwithstanding this, the advantage of his invention to the manufacturing interests of England may be partly seen by the following figures. The total amount of iron manufactured in 1720 was about 12,000 tons, and at the time of Cort's patent (1780) about 90,000 tons, which in 1820 had increased to 400,000 tons, an increase due almost exclusively to Cort's invention. Although he had added millions of pounds sterling to the wealth of the kingdom, and opened the way for the employment of hundreds of thousands of men, the only recognition his services received was the empty honor of being a great inventor and the little estate now occupied by his moldering remains in Hampstead churchyard.

The first important improvement subsequently made in puddling was the invention of Samuel B. Rogers, consisting in the substitution of iron plating to the bottom and sides of the puddling-chamber, covered to a depth of ten or twelve inches with a rich oxide of iron, instead of sand. The plates are so constructed as to allow a free circulation of air, to prevent overheating. This oxide bottom not only permits the working of the iron at a much higher temperature than was possible on the sand bottom, but is itself a valuable agent in the removal of the carbon, silicon, phosphorus, and other impurities contained in the crude metal. The invention of Rogers was fully as important to the trade as that of Cort, yet the most substantial benefit we hear of his receiving was the nickname of "Old Iron-Bottom," by which he was known all over England. But little change has taken place in the process of puddling by hand since the latter invention was introduced; and although it is, in a scientific point of view, one of the most interesting operations in iron manufacture, it is also the most slavish and exhaustive labor to those engaged in it.

The earliest authentic records I find on mechanical puddling are the patents of Mr. Walker and Mr. Warren, of England, who, in the year 1853, took out a patent for a rotating cylinder lined with fire-brick. The axis of the cylinder was inclined to a horizontal axis of rotation, so that, as it revolved, the fluid metal was caused to flow from one end to the other. I am not aware that they ever built a furnace so as to test their ideas in practice. In 1856, Mr. Samuel Danks (the writer's father) filed a caveat in the U. S. Patent Office for a revolving puddling-furnace, and he had a furnace nearly completed in Mount Savage, Md., when the panic of 1857 caused the abandonment of the work for the time. In 1859, Mr. W. Tooth, of London, England, took out patents for a mechanical puddling-furnace, and was given every facility for testing the apparatus by Mr. William Menelaus, of the Dowlais Iron-Works, in Wales, where a complete forge was erected, and some good iron is said to have been produced. The lining used in these furnaces was either fire-brick or gannister, and Mr. Menelaus stated that the latter was found to be the best material he had tried. In 1863, Mr. Tooth and a Mr. Yates obtained additional patents for improvements in the process, all of which were tested at the Dowlais Works. In 1867, after having spent upward of $150,000 in experimenting, it was abandoned. Mr. Menelaus, in a paper read before the Institution of Mechanical Engineers, gave a description of their failures, which were mainly due to the want of a good lining for the puddling-chamber. Afterward, when showing a number of prominent iron-masters through the Dowlais Works, he pointed to the corner occupied by these furnaces as the "burying-ground of mechanical puddling."

It is important to notice that up to this time the only lining used in mechanical puddling was a highly siliceous one (like that used by Mr. Cort in the first introduction of hand-puddling), which would be readily dissolved by the molten metal and the oxides with which it was constantly coming in contact. Under these circumstances, it was found to be practically impossible to remove the impurities from the metal sufficiently to insure a good fibrous iron. Nor was this all; the character of the lining material was such that, when the iron was formed into a ball, its weight constantly broke the lining down, so that it was proved to be unfit to withstand either the chemical or the mechanical action to which it was of necessity subjected. An attempt was made to use an oxide of iron lining in the cylinder; but from the manner in which it was put in, it was evidently an oxide too high in silica for the purpose; or, if an oxide of sufficient purity were melted upon an initial lining of silica, sufficient of the latter would be dissolved during the melting to render it worthless.

During the time when these experiments were carried on in England (between 1863 and 1868), Mr. Danks moved to Cincinnati, Ohio, to remodel the old merchant mill on East Front street, and adapt it to the manufacture of iron rails. Here he again revived the question of mechanical puddling, and had obtained patents for a lining which, it is believed, would answer successfully all the requirements of use. In May, 1868, a small experimental furnace was built, with a capacity of working only about 300 pounds of iron at one charge, being thus limited by the machinery at hand to deal with the iron. Six hand-puddling furnaces were in use in the mill at this time, with the usual complement of workmen; and while the new furnace was approaching completion, the comments made by those engaged in the hand process were not encouraging; for they were, with few exceptions, opposed to any attempts to perform their labor by machinery.

Briefly, the new furnace consisted, first, of a fire-place about four feet square, the outer shell of which was made of iron plates, lined with fire-brick. Adjacent to this was the revolving cylinder, about three feet long and four feet in diameter, with a contracted opening at each end. One end of the cylinder was made to fit close against the fire-place, and the other provided with an adjustable elbow-piece, forming a tight joint with the cylinder end and also serving as a connection between the cylinder and the chimney, by which the waste gases escaped. The cylinder was mounted on four rollers, the end joints kept tight by a strong iron prop which forced against the shiftable elbow-piece, the latter being also provided with a side prop holding it firmly in position while the furnace is at work. The cylinder ends were kept cool by jets of water. The bridge casting, the bridge and door rings, also the front of the shiftable piece, were kept cool by water circulating through them. The fire-place was provided with a bridge-wall reaching half-way up the opening in the cylinder end, to prevent a mixture of the fuel and iron, but leaving a free passage for the gases through the furnace. The fire-grate was also provided with two blast-pipes respectively, for forcing air underneath and over the fire. The bottom blast entered the ash-pit and found its way up through the burning fuel. The top blast entered an air-space formed over the roof of the furnace, and was admitted to the furnace proper through a finely perforated brick arch, as nearly over the bridge-wall as possible. Each blast-pipe was provided with a valve under the control of the puddler. The advantages of forced blast in this form of furnace are many; chief among them are, first, a higher temperature than can be obtained by natural draught; and, second, that a slight pressure of flame may be kept in the furnace, which prevents the entrance of cold air at the cylinder joints, thereby avoiding not only a reduction of the temperature of the furnace, but a waste of iron by oxidation. The cylinder plates are ribbed on the inside so as to hold the lining, and the machine was rotated by a small steam-engine. When every thing else was ready, and the cylinder revolved a number of times, the lining was put in. This was done by first mixing pulverized Iron Mountain ore into a stiff mortar with about six times its bulk of thick lime-cream in a grinding-mill, consisting of a revolving pan and two heavy iron rollers, and with this material covering the ribs of the cylinder plates to the depth of one inch, making an average thickness between the ribs of four or five inches. The lower half of the cylinder was first lined, a good surface being put on it with a trowel, and the whole was then thoroughly dried, by building upon it a wood fire. The cylinder was then turned a half-revolution and the lining completed and dried. This was called the initial lining, and was only used to protect the plates, while the real or working lining was put in.

The furnace being now fired up slowly, a quantity of roll-scale or hammer-slag was first melted so as thoroughly to glaze the initial lining. A large quantity of pulverized ore and some light wrought scrap were now put into the cylinder and melted—the cylinder having been revolved slowly during the melting. After melting, the rotation was stopped and a quantity of dry lumps of ore thrown into the bath, serving the double purpose of presenting a rough surface to assist in agitating the iron, and also to hasten the cooling of the liquid oxide. After hardening sufficiently, a further quantity of ore and scrap was thrown in and melted; this operation being repeated about five times, usually completes the lining. The vitreous coating thus formed is very hard, and I never knew of its breaking down after once being cooled, except at the openings at the ends of the cylinder, where it is thin. The lining gradually wears away, but it is easily repaired and the entire lining need never be taken out unless for some necessary repairs to the plates.

When the furnace was put to the test of puddling iron, the ridicule so lavishly heaped upon it by the men ceased, a lively competition ensued, and it became evident that they had laughed too soon; for the machine had not been in operation many days before it produced seven charges of iron in less time than they could produce six by hand, and required less than one fourth the amount of manual labor, although employing

* Read before the Section of Mechanics and Engineering of the Ohio Mechanics' nstitute, February 27th, 1883.

the same number of men. The quality of the iron was found to be superior in every respect to that made by hand.

This furnace was experimented with for some time, and then, with the view of puddling larger heats and still utilizing the old machinery, two larger ones were built, in which the diameter of the cylinders was about the same, but the length increased to about six feet, it being the intention to divide the charge into two or more balls. This was attempted by leaving apertures in the cylinder plates, through which pieces of soapstone or other refractory material could be inserted, for the purpose of breaking the iron asunder as the furnace revolved. Large lumps of iron ore were left projecting high above the general level of the lining; cast-iron projections, covered with a thin layer of the initial lining, were inserted; but all gave a good deal of trouble, and were finally abandoned as impracticable.

In carefully watching and testing the product of these two furnaces, a much more serious difficulty presented itself. In a cylinder so long in proportion to its diameter, the end next to the fire-grate was always much hotter than the other, and the iron at this end was always the best, thus producing two qualities of iron in each charge. Added to this lack of uniformity (which was not met with in the small furnace) was the labor of separating the iron. There seemed no way left to adapt the system to existing machinery; in fact, experience indicated that the farther we departed from the old method of making the iron into a number of small balls, the better would be the results. Accordingly, furnaces were built with cylinders six feet in diameter and four feet six inches long, in which the entire charge was made into one ball. With slight alterations, the old squeezer was made to take these balls of 600 pounds, and the iron was found to be perfectly uniform. The results obtained were so satisfactory that in 1870 the company authorized the removal of all hand-puddling furnaces as fast as machines could be built to replace them.

One result constantly met with was the subject of much unfavorable comment among those who had not investigated the subject. It was the fact that, instead of the usual loss of from ten to fifteen per cent in weight by hand-puddling, there was a gain of from five to eight per cent; that is, out of 500 pounds of pig-iron charged into the furnace, there were obtained in puddled bars from 525 to 540 pounds. The gain often ran up to ten per cent, but the figures given will represent a fair average.

I will now describe the operation of puddling by machinery, in which we shall find, at least, a partial solution of the above-mentioned seeming impossibility. Puddling is essentially a refining process, and as the refining is best accomplished while the iron is in a fluid state, a gray pig is preferable to a white pig, because it may be kept fluid as long as desired, this property being chiefly due to the amount of silicon it contains. White iron, which usually contains a low percentage of silicon, begins to granulate very soon after melting, unless a large amount of phosphorus is present.

The refining agent used in puddling is an oxide of iron, and a quantity of the latter is usually put into the furnace, in the shape of hammer cinder, squeezer cinder, or roll-scale, with each charge of iron. As soon as they are melted, the furnace is started to revolve slowly, the iron being covered by a bath of liquid oxide. To facilitate the operation, a small jet of water is now thrown, by means of a rubber hose, upon the descending side of the furnace lining, immediately above the liquid iron. This chills a part of the oxide, which, adhering to the lining, is carried down through the iron, oxidizing the silicon, phosphorus, and such other impurities as the iron may contain, and these become incorporated with the cinder. It is interesting to watch these changes taking place. The iron, which at first was quite fluid and somewhat resembling quicksilver, becomes gradually thicker, until, when the refining is complete, it has entirely lost its silvery appearance and comes to the consistency of thick paste or mortar, its melting temperature having materially increased. The bath of oxide, on the contrary, has become more fluid, and its melting temperature decreased. This operation is carried as far as possible without causing ebullition. The temperature is now raised so as to thoroughly liquefy all the oxide, which is now removed from the furnace through a tapping hole. When this is done, the furnace is again put in more rapid motion, so as to thoroughly agitate the iron. Up to this point, the iron has retained a large part of its carbon, which is now rapidly oxidized by the lining of the furnace and causes violent ebullition. The iron has now reached the granulated state, and occupies five or six times the space it did when fluid. The carbonic oxide gas, produced by a union of the oxygen of the lining and the carbon of the metal, presents a beautiful appearance as it bursts through the surface in many hundred jets of pale blue flame. When carbon is burned by free oxygen, it has no effect in reducing oxide of iron; but when the carbon is oxidized by the solid oxides of the furnace lining, the oxide containing it is reduced to the metallic state and is added to the charge; and as from 300 to 600 pounds of iron ore are used (in the shape of lining) for every ton of iron produced, it must be the iron reduced from this lining which increases the charge and makes it greater than the original weight of pig-iron. It is believed by many that silicon has this power to reduce oxide of iron to the metallic state; and it is a fact, well established, that iron containing a high percentage of silicon gives a better yield than iron containing but little silicon, although the carbon in both cases may be the same. The boiling operation usually lasts from ten to fifteen minutes, when the grains of iron unite, forming a spongy mass, which is then removed from the furnace to be squeezed, hammered, or rolled into bars, as may be required.

There were in 1870 and 1871 three forges built to puddle iron by this method—one each in Chattanooga, Indianapolis, and Pittsburg. In the two former, the furnaces and engines were poorly constructed, and, after working for about one year, the defects of building and abuse while working made the repairs so heavy that they were finally abandoned. The plant of ten furnaces in Pittsburg is still in successful operation.

In 1871, Mr. Danks visited England, and, by invitation, read a paper before the Iron and Steel Institute, at a meeting held in Dudley, giving a description of his furnace. This resulted in the selection of a commission of three gentlemen to visit Cincinnati and investigate the subject. The scientific part of the inquiry was intrusted to Mr. George J. Snelus (at that time in the employ of the Dowlais Works), the commercial aspect of the system to Mr. John A. Jones (iron-master of Middlesborough), and the practical working to Mr. John Lester (of Wolverhampton). They came over in October, 1871, bringing with them about forty tons of English pig-iron and iron ore, containing good, bad, and indifferent qualities, all of which were carefully marked. The lining was all taken out of one furnace and a lining of English material put in. Samples were taken from each brand of pig-iron for analysis; also, samples at different stages of the operation during puddling. They weighed all the material used and the iron produced. The examination was a very searching one, and the results fully accorded with our own previous experience. They visited Indianapolis and Chattanooga, where furnaces were at that time in successful operation.

In February, 1872, the first furnace on the Danks system in England was put in operation at the works of Messrs. Hopkins, Gilkes & Co., in Middlesborough. Specimens of the iron produced were severely tested, and exhibited at the quarterly meeting of the Iron Trade. The excitement ran high, and a public invitation was given for the Iron Trade to visit the works in a body on a certain day to see the furnace in operation. In the mean time, a written contract was entered into with the inventor to pay a certain price for the right to use two hundred furnaces; the contract was signed by Mr. Menelaus, on behalf of the manufacturers, and the day fixed for payment. But when the day came, it brought disappointment to the inventor; for, through the efforts of one or two members who had been unsuccessful workers upon this same problem, the contract was repudiated. Many members openly condemned this disgraceful proceeding, and four firms obtained licenses to build furnaces which would puddle 1000 pounds at a charge. Two of these firms met with the same fate as their predecessors at Indianapolis and Chattanooga, and from the same cause. I have no recent information as to whether the others are now working; but in 1878, Messrs. Hopkins, Gilkes & Co. produced with their six furnaces over 10,000 tons of machine-puddled iron, on all of which they realized a handsome advance in price over the iron puddled by hand, owing to its superior quality.

Soon after the starting of our first furnace in England, and the practical demonstration of the successful working of the machine, others entered the field, using our lining and cooling advantages without asking permission; among them were Mr. Adam Spencer, of West Hartlepool, and Mr. Crampton, of the Woolwich Arsenal. Mr. Spencer built an immense furnace, the cylinder of which was about ten feet long, and in which he worked one ton of iron at each charge. He met with the same trouble we had found in the long cylinder, and, failing to obtain a uniform result, soon abandoned it. Mr. Crampton made a new departure in trying to adapt pulverized fuel to the revolving furnace, in 1872. His furnace was a long cylinder with a water-jacket, the shell being made double, and a large stream of water circulating through it. The cylinder was divided into two compartments—one of which was intended as a combustion and the other as a puddling-chamber. The heat obtained is said to have been very intense, but the foreign matter in the fuel impaired the quality of the iron to such a degree that it had to be discontinued. Dr. C. W. Siemens has used the revolving furnace extensively for the manufacture of iron directly from the ore.

On March 5th, 1872, William Sellers, of Philadelphia, obtained patents for a revolving puddling-furnace, in which one end of the cylinder was entirely closed and the gases made to enter and leave through different flues at the open end. The closed end of the cylinder was provided with a large trunnion, by which its rotation was effected and also part of the weight carried, instead of a shiftable flue, by the removal of which access was had to the cylinder. The cylinder and engines were mounted on a pivoted frame, and could be turned at a right angle from their working position. I have no information as to the results obtained with this furnace, but believe none of them is now in operation.

The report of the English Commission made plain the fact that iron of an inferior quality could be rendered sufficiently pure by the process of mechanical puddling to be used in the open-hearth steel process, instead of the expensive charcoal bloom now used. Nothing of importance was done in that direction (in this country, at least) until about one year since, when the Otis Iron and Steel Company, of Cleveland, took up the matter under the direction of Mr. Samuel T. Wellman, superintendent of their works. Their scientific man and also a practical iron-worker were sent to Cincinnati, where our furnaces were at work. Samples were taken back for analysis, and, soon after, they purchased the right to build a furnace capable of puddling one ton at each charge. The cylinder of this furnace is built of steel plates strongly riveted together, and is six feet six inches in diameter and same length. The fire-grate is fitted with our automatic stoker. The furnace has been in operation about six months, and the product put into steel with such favorable results that others are now in process of erection.

It would require a large volume to record all the perplexing problems that have presented themselves to those engaged in perfecting this system. The point which perhaps gave most trouble was the abrasion ring at each end of the cylinder. These rings are not only subjected to a good deal of friction as the cylinder revolves, but also to unequal expansion and contraction. It was important that they should be kept cool; and if the workmen neglected to keep water turned on, they became hot, and, in cooling, became cracked, so that if a large stream of water was turned on, part of it ran into the furnace. The requirements of the case called for a ring which should stand the friction without wearing too fast, be of such material as would stand repeated heating and cooling; and constructed in such a manner that no matter how much water was turned on, it could not get into the furnace. About twenty-five different modifications were tried, both in wrought and cast-iron, and considerable time was required to test their respective merits.

The ends of the first cylinders were straight-faced instead of conical; and when the furnaces were cooled down on Saturdays, the lining was found to have a number of cracks varying from one eighth to three sixteenths of an inch in width, due to shrinkage. During the repairs to the brick-work, these cracks became filled with fine dust; and when the furnace was heated again, they could not close up, and the expansive force was sufficient to break the cylinder plates, though they were provided with heavy wrought-iron bolts and bands. This suggested the conical ends, which were found effectually to remedy the difficulty.

So, indeed, it might be said of nearly every detail of the present mechanical puddling-furnace—all have been suggested by experience; and, although many of the furnaces first started have been discontinued, the work of the past ten years has not been in vain; for progress, though

necessarily slow, has been sure; and it may be safely affirmed that the mechanical puddling-furnace of to-day is not only a durable but an economical machine.

The full benefits of mechanical puddling will not be realized until it has almost entirely abolished the present plan of making pig-iron for mill purposes. The fluid metal will be taken directly from the blast-furnace to the puddling-machines, where it may be worked in charges of one ton each; and the spongy ball, after having been squeezed into a compact bloom, say of fifteen inches diameter, taken directly from the squeezer to a powerful universal mill, and either reduced to a bar from ten to fifteen inches wide and one inch thick, or, if desired, made into a square billet of any size down to five or six inches; the bars cut and piled in lengths required for different purposes; the billets sheared and taken, while hot, to a heating-furnace, where, with a wash-heat, they may be rolled into any small sections required, without the intermediate process of piling, or having been allowed to cool, in one continuous process from the time the ore is first heated until it is bar iron ready for market. Working under such conditions as these, a product of ten or twelve tons can be relied upon from each machine every twelve hours (instead of one and a half tons made by hand) and of a quality superior to that produced by the old system.

THE SMELTING OF ARGENTIFEROUS LEAD IN THE FAR WEST.*

By O. H. Hahn.

(*Continued from page* 115.)

Retreatment of Speiss.—The question of reworking speisses for the silver and gold they contain has been left in abeyance as yet, although it is known that those produced in Eureka, Nevada, in the early stages of that camp, ran as high as $70 per ton in gold and silver. The speisses of Utah contain comparatively little silver and gold, but considerable cobalt and some nickel, also varying quantities of copper and lead. It is, however, more than doubtful whether it would be profitable to extract any of these metals. Speiss is, at all events, more difficult of treatment than matte. It requires grinding and bolting to separate metallic particles, and roasting at a very low temperature to prevent fusion. The process is, besides, very dangerous to the workman, as the dust produces painful sores wherever it settles on the skin.

Smelting-Furnaces.—The object of the smelting process, now to be described briefly, is to reduce the lead and silver contained in an ore to the metallic state, while the other metals remain in part combined with sulphur, arsenic, etc., and the remaining constituents of the ore unite with the earthy matter, forming slag. The smelting operation is performed entirely in blast-furnaces of different patterns and sizes, which should be adapted to the supply and grade of ore, character of fuel, cost of labor, and other local requirements. The cross-section of the shaft-furnaces of this country has varied from polygonal to circular and from square to rectangular, while the hight has remained almost the same for the treatment of easily reducible as for hard smelting ores, namely, from 12 to 14 feet above the level of the hearth-plates. Experience has proved that smelting in furnaces of small area can only pay in special cases, where, for instance, small supplies of rich ores, or refinery drosses, etc., are to be treated. For this reason, furnaces built on the Piltz principle of circular section are losing ground every day, while those of increasing rectangular section, like Rachette's, are rapidly replacing them. The diameter of a circular furnace can not be increased beyond four feet without evil consequences when working under blast of the customary pressure of half a pound per square inch. Blast of a higher pressure would require a corresponding increase in the hight of the furnace; otherwise, the furnace would become unduly hot at the throat, and cause great losses by volatilization. The capacity of rectangular furnaces, however, can be largely increased without raising the pressure of the blast by leaving the width stationary and merely increasing the length of the hearth area. There are furnaces running now successfully which have a section of 3 feet by 7 feet 10 inches, while the success of 54-inch "cupolas" is still to be announced. The smelting capacity of furnaces is, however, greatly modified by other conditions, namely:

1. The nature of the fuel used, whether charcoal or coke.
2. The volume and pressure of the blast.
3. The size of the material to be smelted.
4. The fusibility of the smelting mixture—to which may be added the temperature of the water, if water-jackets are used.

Charcoal of good quality will smelt more charges in the same time and under the same circumstances than coke; but coke will make cleaner slags and less flue-dust than charcoal. A mixture of charcoal and coke will be more advantageous economically in many localities than either alone. The size of the blower and the quantity of air it supplies should be adequate to the size of the furnace, else it can not reach its highest effect. In using blast of a low pressure, less material will pass through the furnace than with one of higher pressure; but it is advisable to work with a moderate blast, so as to allow the smelting mixture sufficient time for complete reduction. Hard ores require a blast of higher pressure than easily fusible ones. The formation of flue-dust can also be regulated by the pressure of the blast, aside from the fuel.

The best size of material for smelting is that of a goose-egg; iron and limestone flux, however, may reach the size of a man's fist, while quartz should be broken much smaller. Such material smelts very rapidly. Pulverulent ores give much trouble by sifting through the fuel and arriving before the tuyeres in a raw state, where they will cake together and form a sow, or enter the slag and cause a loss of metal. Very fine ores, such as slimes from concentrating-works, especially if they are rich in silver, should be agglutinated with milk of lime previously to putting them into the furnace; otherwise, a large proportion will be blown out of the furnace as flue-dust. If roasting precedes smelting, it may be found judicious to bind the roasted ore also with lime. If the slag should show undue quantities of precious metals, this would indicate the necessity of such a method.

The fusibility of an ore is greatly enhanced if it contains much lead and little silica, alumina, and above all no zinc compounds. A large percentage of oxide or silicate of zinc in an ore, even if properly fluxed, is liable to reduce the smelting capacity of a furnace to one half of what it would be if running on more favorable ores. This I have found to be a stern fact in my own experience.

These remarks will prove that, in the first place, a lead blast-furnace has no fixed smelting capacity in tons of material; and secondly, if we do rate its capacity, we should express it in tons of smelting mixture or charge, and not of ore.

The Modern Type of Furnace.—All smelting-furnaces are at present built with much more care, though probably at greater first cost, than the works of fourteen years ago, and with the view of saving every particle of metal that will leave a profit.

The hearth or crucible of the furnace is so strongly incased in cast-iron plates, and secured underneath by a bottom-plate, that the lead has very little chance to escape in that part. The interior is lined with fire-brick all around; the bottom is made of fire-brick also, in the shape of an inverted arch, so that any lead which might creep through the joints may not raise it up; and no tamping, to the composition of which old smelters paid so much attention, is used. The depth of the hearth is arbitrary within certain limits, say 22 and 30 inches. In one side of the hearth, close to the bottom, a channel four inches square (or round, if preferred), running up toward the top of the hearth-plates, is started for an automatic outflow of the lead. This may widen into a bowl at the top, to admit the introduction of ladles for dipping the metal, but not necessarily, as in many works the lead is tapped through an orifice a few inches below the upper edge of the hearth-plate into a cooling-kettle, so as to admit the skimming of the dross or impurities which may be suspended in the lead previous to its being cast into molds. The water-jackets are placed on top of the hearth-lining in such a manner that their interior lower edges are flush with the walls of the hearth. These jackets may be made of cast-iron, wrought-iron, or any other suitable metal, and may be set perpendicularly or inclined, or they may be provided with boshes of different angle (usually 65 degrees or 70 degrees) to suit the fancy of the smelter, and they may reach to the charge-floor, or may be only a few feet high. I prefer the jackets of Mr. Eilers's construction. They are 3 feet 6 inches high, and have a bosh beginning 10 inches above the center of the tuyere-openings, which are cast into the jackets. They are also provided with a large, projecting lip, rising four inches above the top of the otherwise closed jacket. This lip is open, and mainly serves for the purpose of keeping the jacket filled with water; but it also prevents the formation of steam, allows the introduction of tools to remove scale, and receives the feed-water. It is also provided with an outlet for the hot water. The cold water, on account of its greater density, sinks gradually to the bottom, while the heated water rises and flows into a waste-trough. This jacket, and in fact the whole furnace, has been adopted by many smelters with slight changes, but these changes are only of degree and not of kind. The tuyeres are 10 inches from the bottom of the jacket, and distributed symmetrically about the interior of the furnace, except in front—where they have been found inconvenient and even unnecessary—in the proportion of one tuyere of 3-inch opening for about every 2 square feet of hearth area. So a furnace of 3 feet by 6 feet 6 inches area would receive nine tuyere-openings; one of 3 feet by 5 feet, seven, and so on. The object of the boshes is to enlarge the horizontal section of the upper part of the furnace, with a view to diminish the velocity of the escaping furnace gases, and thus cool them. The front jacket—or jackets, if made in sections—is shorter than the others and reposes on 10 inches of brick-work, in the midst of which the slag-hole is located. This is done in order to facilitate the cleaning or "barring out" of the furnace by mechanical means, should it ever become necessary. Where the charge is of such a nature that the resulting slag will soften the brick front too much, a Luermann cinder-block can be inserted to advantage. The upper part of the furnace, including the chimney, rests on cast-iron plates supported by wrought-iron girders or rails, which are bolted at their ends to the top plates of four cast-iron posts. The space intervening between the tops of the water-jackets and these cast-iron plates, which may vary from one foot to two feet, and is left to facilitate the extraction of leaking jackets, is filled in with courses of fire-brick. The charge-doors are on the long sides of the furnace, not directly opposite each other, but each near diagonally opposite corners, in order to compel the feeders to spread their charges uniformly. The doors are high enough to allow a man to stand erect in them in case wall accretions have to be cut out; they are usually closed to within two feet from the bottom of the frame.

At a convenient hight above the charge-floor, a tube or flue, four feet in diameter, made of stout sheet-iron, is inserted in one of the walls of the chimney—which one, local circumstances will dictate—at an angle of not less than 45 degrees, terminating in a dust-chamber or a system of dust-chambers, which are again connected by a flue of sufficient size with a tall stack. The top of the chimney is provided with a door or damper, which can be opened or closed instantly by means of a chain reaching through the roof close to the feeder's grasp. In the flue connecting the furnace with the dust-chambers, frequently called the "downcast," there is also a damper, placed in such a manner that the feeder can at once open or shut off communication with the chambers. This arrangement is necessary to prevent explosions in the chambers through the sudden blazing up of the furnace, and to protect the workmen from the noxious fumes while the dust-chambers are cleaned out.

At the new Grant Smelting-Works, near Denver, the gases and fumes are drawn off below the level of the charge-door by a plan similar to the arrangement at Freiberg. For a full description of those works and drawings accompanying it, the reader is referred to the files of the ENGINEERING AND MINING JOURNAL, Vol. XXV., No. 12.

Water-Jackets.—Water-jackets have been adopted in every place where there is a sufficiency of water. But wherever the supply of water is scanty and unreliable, I should not advise their use, even if the material for lining the interior of the furnaces is not of unexceptionable quality. On this ground, I believe, the Eureka Consolidated Company has retained its ponderous stone furnaces; for the relining must be certainly expensive, if we consider that the sandstone has to be hauled a distance of thirty-five miles, and that mechanics there receive very high wages. It is true I saw, several years ago, a furnace in operation there which had been in continuous blast for more than a year, according to

* From advance-sheets of *The Mineral Resources of the United States*, published by the United States Geological Survey, Department of Industrial Statistics. Albert Williams, Jr., Chief of Department.

the statements of the foreman; but such campaigns are exceptional and are sometimes made for effect; probably it might have been wiser and better for the furnace if it had been blown out sooner.

Air-Jackets.—In May, 1878, the Eureka Consolidated Company had an experimental furnace erected by Mr. Gerrish, in which air-jackets were to take the place of water-jackets. These jackets consisted externally of sheet-iron, to which were bolted, by means of flanges, copper plates 1½ inches thick, forming the interior of the furnace. There were eight tuyere-openings with four-inch mouths in the jackets, and one foot above the hearth. Eight inches above these there was another row of openings of the same diameter, but only in the outer shell, which were connected with the former by closely-fitting pipes. The object of these connections was to allow the hot air from the jackets to pass directly into the furnace. Each sectional jacket had of course a connection with the blast main. The furnace was elliptic in shape, and its hearth area corresponded nearly with that of the other furnaces, and was 3 by 6 feet. The blast was supplied by a No. 5 Baker blower, making 104 revolutions per minute. Unfortunately, the experimenter did not provide his furnace with a fore-hearth, as is customary in Eureka; and as he did not or could not flux the ore at all, he did not get the slag to run. A speiss sow frustrated the completion of his experiments. The impracticability of air-jackets was, however, proved to the satisfaction of the company and that of the numerous pilgrims who flocked to Eureka from White Pine, by the appearance of the copper plates, which were perforated like colanders by the action of the speiss.

Except at Eureka and a few other localities, all furnaces are now provided with closed breasts, and the slag is run out intermittently instead of continuously. The slag-pots are so constructed that they hold about 300 pounds, which corresponds to a charge of about 400 pounds.

Blowers.—The blowers mostly in use are the various sizes of the Baker patent, which have driven out of the field nearly all the Sturtevant fans and a good many Root's blowers. They give universal satisfaction, and do not require so much attention as the others. The blast is measured either by mercury or by water-gauges which are attached to the blast supply-pipe of each furnace. A column of two inches of mercury or of 28 inches of water is equal to the pressure of one pound to the square inch.

Fuel.—The fuel is either charcoal or coke, or both mixed. Too much stress can not be laid on the soundness of the wood from which charcoal is made. In Southern Arizona, and perhaps also in other regions, all attempts at smelting with charcoal alone have failed, and I found that all the oak timber, which was the most abundant for making charcoal, was rotten in the core. Hard charcoal from mahogany, cedar, etc., is also to be rejected for use in a blast-furnace, because it decrepitates into small particles, which have the same effect as coal slack or waste in chilling the slag through reduction of the temperature. Nut pine (piñon) makes the best charcoal, and this was formerly the principal fuel at Eureka. Charcoal from lighter woods, such as yellow and white pine, quaking aspen, etc., can not be used alone without reducing the temperature in a furnace. Every smelter who has practiced in Leadville will agree with me on that point.

The best coke I have used is an English patent coke, which is shipped extensively from Cardiff, Wales, to San Francisco, where it costs $14.50 per ton. It is porous and light, and leaves a very small percentage of ash. The Connellsville coke is the next best; it is very dense and heavy, and yields about 5 per cent ash; but it has been driven almost entirely out of the market in the West by the English and Colorado coke, on account of the freight charges, which swell its price to a high figure compared with the others. There are two kinds of Colorado coke in the market, the El Moro and the Crested Butte. I prefer the latter, others prefer the former; yet the difference is but trifling.

Owing to the different fusibility of different ores, the percentage amount of fuel must be referred to tons of charge, in comparing the consumption in various localities. This brings out the remarkable fact that smelting at a high altitude requires more fuel than at a lower one. In Leadville, for instance, the consumption of mixed fuel amounts to from 22 to 24 per cent of the weight of the smelting mixture, while in Salt Lake Valley it amounts to from 14 to 17 per cent; the lower figure corresponding to the summer and the higher to the winter season, when the ores absorb more moisture than in summer.

Where charcoal alone is used, the percentage of fuel is somewhat higher, probably between 26 and 28 per cent. Correct data are lacking, because this kind of fuel is usually thrown into the furnace by bulk, and the weight is only approximated. How little reliability can be placed on such approximations, I had occasion to experience in a remote mining district, where more fuel was used than the proprietor of the works had purchased (inclusive of waste). This is, of course, an absurdity. It is therefore advisable, in the interest of regularity of the furnace operations, to weigh not only ore and flux, but also the fuel, as accurately as possible.

Fluxes.—The fluxes most frequently used are:

1. Quartz, sandstone, clay slate, or other highly siliceous rocks, to supply any deficiency of silica which might be required to saturate the basic gangue in an ore.

2. Hematite, magnetite, limonite, and specular iron ore, and the various manganese ores, if iron is lacking in an ore.

3. Limestone, dolomite, and calcareous shale, if calcic oxide is not in sufficient quantity in an ore to form a slag of the type desired; to which may be added slag and metallic iron, it we follow Webster's definition of flux as "any substance or mixture used to promote the fusion of metals or minerals."

The action of slag is, however, more of a mechanical than of a chemical nature, unless it should have the characteristics pointed out in the discussion of slags. If a coarse-sized smelting mixture is to be worked, an addition of slag to promote its fusion is entirely superfluous, and would only increase the cost of smelting; but if the charge is very fine, or if much zinc is present in it, slag will very materially promote its fusibility. I have found the correctness of this statement to be confirmed while at Robinson, Colorado.

It is a matter of the greatest moment that the fluxes should be as free as possible from impurities, to insure success in smelting. So, a bituminous or a siliceous limestone would not be exactly the correct flux to select if we wanted lime for ore. As carbonic acid does not take any part in the composition of a slag, burnt lime would theoretically be the best; but as it rapidly attracts carbonic acid and water, thereby reducing its money value, and as it presents mechanical difficulties in the furnace, its application has never become general. It was at one time extensively used at the American Smelting-Works in Leadville.

An iron ore containing 22 per cent of silica and 68½ per cent of ferric oxide would be indeed a very bad flux, since the 22 per cent of silica requires a certain amount of ferrous oxide and also a certain amount of calcic oxide to form a slag of the same composition as is desired. The ferrous oxide required by the silica of the flux has then to be deducted from the ferrous oxide corresponding to 68½ per cent ferric oxide. The remainder will be the real available ferrous oxide (or "excess of iron," as it is termed in Leadville), which will probably not amount to one half of the original 68½ per cent. An admixture of iron pyrites in an iron ore would reduce its value in a similar manner, as so much metallic iron would have to be deducted from the total iron contents as is necessary to convert FeS_2 into FeS.

It does not require much reflection to perceive from the foregoing that the presence of extraneous minerals in quantity increases the bulk of the fluxes at an alarming rate, while the ore may become the smallest part of the smelting mixture. In this case, the percentage of lead in the charge will arrive at a point where smelting is no more profitable. Such cases have occurred in Southern Arizona, where bad fuel and poor fluxes have ruined the lead smelter.

(TO BE CONTINUED.)

FURNACE, MILL, AND FACTORY.

The Colorado Coal and Iron Company, at South Pueblo, Colo., is running on single turn, employing about 700 hands. It is quite busy, and was recently working on a large order of steel rails, 36 pounds to the yard, for the Chicago, Burlington & Quincy Railroad Company.

Captain William Hooper, of the Ticonderoga mines, reports that he has used Dixon graphite grease for coating wire rope, and, giving a coating once in ten days, finds that it prevents rusting and decreases abrasion.

A 150 horse-power Cummer engine will furnish the power for the electric light display at the Cincinnati Exhibition, and a 125 horse-power engine of the same make has been selected to drive a line of shafting at the Louisville Exhibition. The Arlington Woolen Mills, Lawrence, Mass., have put in a Cummer engine, and an engine has also been sent to the Nonatun Worsted Company, Newton, Mass. Among the recent orders are a 16 by 30 steam-jacketed condensing Cummer engine, by S. D. Warren & Co., Cumberland, Maine; a 300 horse-power engine for Messrs. Cain Brothers' flouring-mills, at Atchison, Kansas; a 90 horse-power engine for the Keokuk Plow Company, Keokuk, Iowa; an engine and boilers for the Case & Willard Thresher Company, Battle Creek, Mich.; and an engine for C. R. Cooley & Co., Hartford, Ind. At the 550 barrel flour-mills of D. Suppiger & Co., Highland, Ill., a Cummer engine was started a few days ago, and the Brush Electric Light Company, of Cleveland, has just put in a very large Cummer engine.

The new sheet and plate-mills at Birmingham, Ala., are completed.

The Talladega (Ala.) *Home* says that the Alabama Iron Company, at Alabama furnace, has increased its capital stock to $300,000, which is all paid up, and will shortly begin the erection of another furnace of a daily capacity of forty tons.

The Edgar Thomson Steel-Works, at Braddock, Pa., which are now blowing pig from the furnace directly, are putting in the Gjers soaking-pit.

Mr. W. Hollingsworth Whyte, one of the receivers of Thomas H. Paul & Son, says there are two or three parties in Baltimore who wish to buy the Paul Locomotive-Works, and that whichever of them becomes the purchaser will carry on the works. An order of sale at private sale was signed by the court recently. One of the probable purchasers is largely engaged in the machine business in Baltimore.

It is stated by the St. Ignace *Republican* that the Vulcan Furnace Company has 9000 tons of pig-iron on hand at Newberry. The entire amount will be shipped *via* the Detroit, Mackinac & Marquette Railroad and the Detroit & Cleveland Steam Navigation Company's boats to Detroit. The same paper mentions that the Martel furnace, at St. Ignace, has been doing excellent work since going into blast on the 1st inst. Three casts are now run off daily, and the charges are to be gradually increased until the maximum of production is reached. The iron produced is of superior grade.

The blast-furnace and the puddle-mill at Bay View, Milwaukee, were both shut down on the 20th. It is not known when either department will start up again. It is reported that the blast-furnace will not be started up again until next February, but this report is not accredited. An officer of the North Chicago Rolling-Mill Company states that, although it was not known exactly when the furnace will start up again, it would not remain idle very long. It is simply shut down to enable the company to work off the over-stock of pig-iron on hand at present.

The furnace of the Nova Scotia Steel-Works, at Trenton, was lit a few days ago, and the work of manufacturing steel has already begun. The works are conveniently situated on the banks of the East River, a short distance below Smelt Brook, between the river and the line of the Intercolonial Railroad. During the past year, the work of construction and collecting machinery has been in progress, and the establishment is now pretty well equipped. The Nova Scotia Company was formed on the 12th of April, 1882. The situation chosen is an admirable one; for, in addition to the proximity to the coal mines and the iron deposits of the East River, the facilities for shipment by rail or water are unsurpassed. A siding has been built connecting the factory and the coal-sheds with the Intercolonial Railroad, and a steam traveling-crane of ten tons capacity running through the main building moves all heavy weights from place to place when required. The buildings, which are suitable and substantial structures, cover nearly one and a half acres of ground, giving ample room for carrying on the work. The furnaces are capable of turning out some 9000 tons of steel per annum.

The creditors of Brown, Bonnell & Co. met at the bank of Wick Brothers & Co., Pittsburg. Among the more prominent of those present were Messrs. George A. Berry, of the Citizens' National Bank, and Solomon Schoyer, Jr., of Pittsburg; Daniel P. Ellis and W. H. H. Harris, of Cleveland; J. H. Van Dyke, Milwaukee; James Westerman, Joseph Firker, and B. Magoffin, Sharon; E. Ogleby, Wheeling; J. E. McFarland, Meadville; and W. H. Baldwin, J. H. McEwen, Paul Wick, F. H. Matthews, W. H. Baldwin, H. M. Garlick, John I. Williams, H. O. Bunnell, Ralph J. Wick, and A. B. Cornell, of Youngstown. Mr. George A. Berry, of Pittsburg, was elected chairman of the meeting, and W. H. Baldwin, of the First National Bank of Pittsburg, Secretary. Mr. Brown, the receiver, then submitted a detailed and complete report of the business done by the mills under his management. It was reported that a new company was forming. As a portion of the stock yet remained unsubscribed, Messrs. Paul Wick, James Westerman, H. O. Bonnell, Robert McCurdy, and William McCreery were appointed a committee to request the creditors who had not already subscribed to the new company to transfer the balance due them into stock. Before adjournment was had, a resolution was unanimously passed complimenting Mr. Brown on his management, and requesting the court to continue his receivership until the new company was ready to take hold.

From Jerome, Yavapai County, Arizona, Mr. Frederick F. Thomas, superin-

tendent of the United Verde Copper Company, reports to Messrs. Fraser & Chalmers, of Chicago, that the furnace and machinery furnished by them have worked very well, the furnace reducing 40 tons of ore and yielding 8 tons of black copper per day. The Silver Bear Copper Company, of Kansas City, has ordered a duplicate of the United Verde plant. The mine is near the Copper Queen at Bisbee.

GENERAL MINING NEWS.

ARIZONA.

COCHISE COUNTY—TOMBSTONE DISTRICT.

GIRARD.—The Tombstone *Republican* reports that the mine and mill have been sold under execution, and bid in by Judge G. G. Berry for the amount of the execution and costs—$47,909.04. Under the new management, this property, which has been lying idle so long, will be started up.

PIMA COUNTY.

GUNSIGHT.—According to the Tombstone *Epitaph*, the sheriff has sold the entire property of this company to Charles Hudson, the banker, at the following prices: Mill, $40; Eastern lode, $41; Silver Girt, $40; Gunsight mill-site, $45; 160 acres, $40; total, $206.

PINAL COUNTY.

QUEEN CREEK.—The smelter started up recently is running on Australia ore. Every thing works well so far. The object of this run is principally to test the capacity of the furnace and the quality of the ore. A later report says that a heavy rain-fall has rendered it impossible to proceed with the work.

RAY COPPER COMPANY.—The superintendent reports to the New York office August 20th: During the last week, in Ray mine, winze No. 1 ran into a heavy seam of native copper, being the richest ore we have yet struck. We have sunk on the same some three feet. The north drift is still in the same character of ore as last week. These are the only two points I am working on, because the windlass can not do more than handle the ore as fast as we get it from these two places. I have been pushing the tunnel with all the force I could systematically work. I have also graded from the mouth of the tunnel to the dump, and fixed for the ore-dump. Winze No. 1 is now down 64 feet; the second drift is in 58 feet; north drift, 26 feet. The tunnel is cleaned out and retimbered 32 feet (about 85 feet to winze No. 1 through tunnel).

CALIFORNIA.

INYO COUNTY.

DEFIANCE.—During the past three months, the main incline shaft has been sunk 194 feet, making a present depth of 286 feet. The work is in a ledge carrying frequent bunches of pay ore. Two shifts are kept at work, and the shaft will be continued to a depth of 700 feet. The late run of the furnace was stopped until a supply of "wet" or lead ores can be extracted, with which to smelt about 100 tons of "dry," rich silver ores remaining on the dump.

PLUMAS COUNTY—GREENVILLE DISTRICT.

GREEN MOUNTAIN.—No. 6 tunnel is now in 1724 feet, and is advancing at the rate of seven feet per day by three eight-hour shifts. The company is just completing new cars, and will soon be running out rock, with a train of four. A horse will be put on as soon as the cars are completed, and it is expected an increased advance per day will then be made. The face of the drift is in favorable ground.

SAN BERNARDINO COUNTY.

BULLION.—Work was begun on this quartz mine about two months ago, and has been steadily prosecuted. Developments at the north end of the claim showed the ore to be very low grade, and hence work was suspended here and continued at the southeastern end of the claim. A shaft was sunk to a depth of 50 feet, which passed through a number of small pockets of very rich ore, but the average ore is low grade. While prospecting around the claim, a rich piece of chloride was discovered near the place where work was first begun at the northern end. Work will be temporarily suspended in the new shaft, for the purpose of developing the new strike.

KING.—Between the third and fourth levels, a rich strike has been made. A vein of ore about two and a half feet in width has been uncovered, and assays made show good results.

TAGGART.—Operations continue with good results.

SIERRA COUNTY.

ALASKA.—Two large boilers have been shipped to this mine at Pike City. About five car-loads of other machinery are now *en route*. The hoisting-works are to be rebuilt and in operation before winter comes. The burning of them a few months ago was a severe blow. The lower levels of the mine are showing up well.

RUBY.—The striking of gravel in a shaft that had been sunk from No. 2 tunnel has caused great excitement. Several car-loads of gravel have been washed, and have yielded five dollars in gold. The bottom of this shaft is on a level, and about one hundred feet ahead of the face of the lower tunnel. The lower tunnel will be pushed ahead into the new ground at once.

CANADA.

PROVINCE OF NOVA SCOTIA.

Reports state that the agents of a syndicate of Boston and New York capitalists has purchased the gold mine at Mount Uniacke, one at Chezzetcook, and, it is rumored, several others. Extensive works will be executed upon each of the several properties thus acquired, and the new proprietors intend to push things.

The Sydney & Louisburg Coal and Railroad Company has recently engaged in the manufacture of iron from the ore found in Cape Breton Island. The analysis of the ore as made by Mr. B. J. Harrington, lately Chemist and Mineralogist to the Geological Survey of Canada, is as follows:

Peroxide of iron	85·037
Phosphoric acid	0·032
Sulphuric acid	0·075

The ore is in large quantity on the Island, which also possesses an inexhaustible supply of coal, and the Cape Breton *Advocate* understands that it is the intention of the Reserve colliery to henceforth manufacture its pig-iron from native ores. It will, in that case, manufacture its own wheels and other iron work.

COLORADO.

BOULDER COUNTY.

VAN FLEET STAMP-MILL.—The mill now at Ballarat will be removed to Jamestown as soon as a proper site can be obtained. Good concentrating facilities are what Jimtown stands in need of.

CLEAR CREEK COUNTY.

PACIFIC MINING AND REDUCING COMPANY.—A dispatch from San Francisco says that this company has filed a petition in insolvency. The capital stock was $10,000,000. The company, it is said, expended $80,000 on its works at Idaho Springs, and also expended $80,000 here. The principal unsecured creditors are John Durand, of Rochester, N. Y., $27,644; Dwight Loomis, of Rockville, Conn., $12,296.95; and T. S. Dumont, Summit, N. J, $5337.93.

CUSTER COUNTY.

BULL-DOMINGO.—This mine, near Silver Cliff, which has been lying idle several years on account of litigation, is to be opened up again. The formation is very similar to the Bassick, and while the ore is not of so high a grade, the quantity is larger, as far as developed. All of the old lawsuits are either settled or dead, and the company has been reorganized, with a capital of $200,000. Out of this amount, a working capital of $65,000 is set aside for development-work, Mr. N. B. Stevens, the general manager and superintendent, is now on the ground, and will immediately put a large force of men to work. The concentrator, which has a capacity of from 75 to 100 tons per day, will be started up again. The mine formerly gave work to about 150 men.

HUMBOLDT.—On the 500-foot level, a rich strike has been made. The vein is twelve inches wide, and assays run high.

DOLORES COUNTY.

DOLORES VALLEY.—This organization owns 84 claims throughout the entire San Juan. In Rico, the company has buildings which cover eight town lots. The Zulu, Peru, Little Giant, Jenny Lind, Stony Point, Vampire, and Atlanta, all on Silver Creek, will be worked through a cross-cut tunnel which will cut the veins 1500 feet below the surface. From this tunnel, cross-cut drifts will follow each vein. The tunnel is in 190 feet through a very hard limestone formation.

EAGLE COUNTY.

BUCKEYE.—The Henry Dawson mine, the property of this company, has a shaft 174 feet deep, with numerous drifts, cross-cuts, etc., to say nothing of a cave of no small proportions, with ore exposed on all sides of it. There is in the main workings of this mine a breast of ore known to be forty feet in depth, from which numerous specimens showing free gold have been taken.

EL CAPITAN.—As soon as the best means for saving the gold are found, this property will be worked extensively.

WILD CAT.—This property is said to be one of the most valuable pieces this side of Tennessee Pass. It is developed by a shaft 175 feet deep and a drift in which they struck the ore, which has widened out and now covers the whole face. It runs in gold higher than any other property of this hill. The last find was gray quartz, in which the free gold was seen with the naked eye. It pans well, and assays show it to be a very valuable body, which in time will yield second to none in the camp. It has for some time been working under a lease, doing, however, development-work mostly, rather than with a view to the extraction of ore.

GILPIN COUNTY.

ILLINOIS.—A cross-cut to the north vein at a depth of 350 feet is driving. Since the formation of the pool, $29,000 have been expended in doing development-work in addition to what has been taken out of the mine.

WHITING.—A vein of mineral of over fifteen inches in width has been exposed. Sinking had been done alongside this vein. Another streak of pay—a brownish sort of iron—has been struck, which prospects well in the pan. The shaft is now down to a depth of nearly 300 feet, and sinking is continued.

GUNNISON COUNTY.

ROSE & REED MILLING COMPANY.—The company is ready to start up a five-stamp battery, which will be used to utilize the tailings, as it is believed that stamps will be more effectual in the work than rolls. There is room for twenty stamps, and more will be added when necessity demands.

SILENT FRIEND.—A seven-sixteenth interest in this mine at Pitkin, has been sold for $133,000. The remaining interest was recently purchased by J. W. Hanna, of Denver, in this mine. Both sales are made on a valuation of $300,000 for the whole mine.

WILDER-MCDONALD.—The concentrating-mill has commenced running. The machinery works satisfactorily.

LAKE COUNTY.

A new bank, to be known as the Carbonate Bank of Leadville, has been incorporated, to supply the vacancy created by the failure of the Bank of Leadville. It will open its doors September 2d, in the building occupied by the insolvent bank, with a capital of $50,000. Its incorporators include some of the best men of Leadville.

In our last issue, we referred to the California Gulch Extension of the Denver & Rio Grande Railroad. The latest information states that it will run up on the north side of the gulch, until the Rock and Stone mines of the Iron Silver group are reached. The road will then cross to the south side of the gulch, on the territory of the Gilt Edge chain, and, continuing up the gulch a short distance farther, will recross to the Breece Hill side, making a horse-shoe. The road will then again strike Iron Hill near the Colonel Sellers mine, and wind its way around the hill, ascending gradually, and passing on the way the mines of the Iron Hill Consolidated, Smuggler Consolidated, Silver Cord, and Iron Silver mines. The Rock, Stone, and La Plata mines will be placed within reach of the railroad by a siding which will pass the large Stone ore-bins. The enterprise of the Denver & Rio Grande Railroad Company will give the mines of California Gulch and Iron Hill a much cheaper and more reliable method of transportation for their products.

ADAMS.—Exploration-work in these properties on Carbonate Hill is making very encouraging headway. The drift from the Clontarf shaft, calculated to connect with the Brookland, has advanced 125 feet, which leaves about 175 feet of drifting to connect the two shafts. The drift is running in a solid body of ore, and the mine is shipping from fifteen to twenty tons of ore a day. The mineral in the bins at the mine is all a fine sand carbonate, running from forty to sixty per cent in lead and fairly well in silver. The entire product of the mine is said to be the result of development-work, and no stoping is carried on. The Brookland shaft is supplied with a new lift-pump, which has recently been ordered, and the pumping machinery on the shaft is idle in the mean time. The new pump will be in place and in working order within a week.

FANNY.—A strike of from four to six feet of galena and lead carbonates has been made. The ore, to all appearance, is not of very high grade, but the extent of the body will insure handsome profits for the lessees. The contact in which the ore was discovered is the same as that of the Nellie S. and other neighboring mines.

HARRISON REDUCTION-WORKS.—One of the four furnaces blew out August 20th, and it is expected that the others will be obliged to follow soon. Want of ore is the reason. It is hoped that the suspension will only be temporary. A report just received states that the company has succeeded in securing the ores of the Iron Hill Consolidation Company's mines. The output ranges from fifty to seventy-five tons a day; and the ore is said to be the most desirable smelting ore produced in Leadville.

IRON SILVER.—Included in the new work recently begun by this company is a large tunnel, driven in from the south side of Iron Hill, and calculated to pass below the large ore-bodies lately opened in the Lime and Bull's Eye claims, now working on leases and producing largely.

LEADVILLE GOLD AND SILVER MILL.—The stamp-mill has been shut down for some time past. It is not known when it will be started up.

LITTLE CHIEF.—A number of tons of the ore taken from the recent strike have been shipped to the smelters, and samples of the ore-breast return $150 per ton on the first-class material and $75 per ton on second class. The mineral is a galena and sand carbonate, and shows chloride of silver in appreciable quantity. The ore-body is situated 215 feet north of the Daly shaft, and about thirty feet west of the Little Pittsburgh line. The length of the Little Chief claim from the Daly shaft to the north end-line is 330 feet. The twenty odd jigs of this company, situated in Big Evans Gulch, have been closed down, throwing sixty-four men out of employment. Eight or ten men are still retained in sorting over ore containing a fair amount of silver and running high in iron. The jigs have been running for several months past, and added considerable to the production of the Little Chief mine during July. During the past few weeks, the grade of the dump material has deteriorated in value, until it was found impossible, by the closest work, to make the concentrating enterprise pay. By means of crushing and a complete concentrating mill, there is no question but that much

of the ore on the dump can be worked profitably, as well as the tailings from the hand-jigs that have lately been worked. Parties are experimenting, and have attained satisfactory results. The results are, that several offers have been made the company's manager for this material. No proposition will be accepted until the next annual meeting of the stockholders, in October next.

LITTLE PITTSBURG.—The drift from the No. 9 shaft, situated near the Amie line, has been extended northward along the line for 175 feet. Winzes and rises have been made at regular intervals, and in several instances iron ore, carrying small quantities of galena, has been intersected. In places, the iron has a thickness of sixty feet, tapering down to as little as two feet. Several tons of ore have been shipped, but only moderate returns were received. The Dives ground is being thoroughly exploited from No. 6 shaft, from which drifts extend to the O. K. and Little Chief claims. Should the work now in progress prove futile in the development of new ore-bodies, a drift will be driven from No. 9 to No. 10 shaft, as between these two shafts a strong chute of iron ore is known to pass.

O'DONOVAN ROSSA.—Operations are to be resumed.

SILVER CORD.—The hoisting-works, ore-houses, and other property of this company, destroyed by fire July 15th, are rebuilding in a more substantial manner, and it is expected that they will be running by the first of October. The mine is looking well, and has an output, with a temporary plant of about 100 tons of ore a day, which averages about $25 a ton. The total output for July was 2886½ tons. Expenses for month, $28,834.95. Profit, $40,524 20. This is a very good showing, considering the present circumstances. The total product from January 1st to August 1st, 1883, amounts to $703,332.97.

WILLIAM WALLACE.—The ore-streak, recently discovered and mentioned in last week's issue of the JOURNAL, has since opened out to about eighteen inches of fine mineral, and the ore-body continues improving as the work advances. The ore was evidently the southern edge of a true ore-chute, and gives indications of opening out into a large body.

PUEBLO COUNTY.

COLORADO SMELTING COMPANY.—The works have probably blown in by this time. The boilers were fired up on August 19th, and the main engine started for the first time. It worked smoothly. A big pile of ore is on hand, besides plenty of fuel. The ore-bins are nearly completed. The elevated tramway from the sampling-works to the smelter is ready for use. Only three furnaces will blow in at present, but the material is on the ground for the fourth furnace, and it can be built at any time on a few days' notice.

RIO GRANDE COUNTY.

SAN JUAN CONSOLIDATED.—Mr. Thomas M. Bowen has disposed of a controlling interest in this company to Mr. M. W. Cooper, of New York. The amount paid is reported to be $900,000. Mr. Cooper is very largely interested in the Annie Consolidated mines, which adjoin the San Juan. The mines are now to be worked very extensively.

DAKOTA.

CALEDONIA.—The superintendent reports for the week ended August 19th: Ore produced, 300-foot level, 945 tons; 400-foot level, 105 tons. Shipped, 473 ounces gold; value about $8000. The 400-foot level header has advanced five feet, making a total of thirty feet. All other parts of the mine look about as usual.

FATHER DE SMET.—The report for the week ended August 21st shows: Ore extracted from first level, 750 tons; second level, 750 tons; third level, 525 tons. Ore milled, 2025 tons. Golden Gate south header is in 20 feet.

FAIRVIEW.—Work continues. The main tunnel is in 200 feet, and will tap the ledge within the next forty feet, and 156 feet beneath the surface. The mill will be moved from Elk Creek to the Fairview.

ORO FINO.—Much of the machinery for the hoisting-works is on the ground, and will soon be in place.

IDAHO.

SOLACE.—This mine, which is owned by J. B. Haggin, of San Francisco, is showing a good vein of ore that, it is believed, will yield at least $500 per ton. The superintendent is endeavoring to make arrangements with the Vienna Mill Company to have a lot of ore now on the Solace dump run through the mill, but the rate, $35 per ton, is too high.

VIENNA.—The mill has been running steadily for six weeks. Of the 20 tons worked daily, about 12 tons are from the Mountain King and eight tons from the Vienna mine, both of which are the property of the company. The King ore is of low grade, while the Vienna ore is quite rich. The cost of mining and milling should not exceed $20. The ore-bodies in sight in the Mountain King and Vienna mines are very extensive, and ample to keep the mill running for at least three years. Specifications are preparing for ten additional stamps which are to be put in next spring.

MICHIGAN.

The following figures show the total amount of iron ore shipped from all lake ports up to August 22d:

	Tons.
Escanaba	821,929
Marquette	386,961
L'Anse	36,216
Total	1,245,106

NEVADA.

ELKO COUNTY—DELANO MINING DISTRICT.

This district was formed several years ago, and considerable work was done on the various ledges. Some of the claims paid for a short time, but there being no water near, and several other things operating against the district, it was abandoned for a time. Lately, however, work has been in progress on the Louisa mine, which has been developed to a depth of 110 feet on the ledge. The vein is five feet wide, having three feet of good ore, and two feet of ore mixed with clay. Assays run 30, 75, and 210 ounces of silver per ton. The shaft is to be sunk to a depth of 300 feet.

ESMERALDA COUNTY.

MOUNT CARY.—Work on the reduction-works is progressing rapidly. Timbers for the foundation are put in as fast as the grading is completed. The leaching-room is nearly finished. The greatest activity prevails around the works. One hundred and five men are employed on the grade, and every branch of the work is pushed with the utmost vigor.

HUMBOLDT COUNTY.

The copper mines recently located in what is called the Clove Meadows District are said to be quite extensive. Miners are now at work on one of the copper mines, which is now from 12 to 15 feet wide. It is the intention to take out about 1000 tons of ore before erecting smelting-works. This new district is a part of what is known as Columbia District, which embraces Bartlett Creek.

LANDER COUNTY—BORNICE DISTRICT.

The mill in this district is doing good work on ore from Goodell's mine. The roaster has not yet been started. The ore by free process works over 85 per cent. The first bar of bullion turned out was 989 fine.

LINCOLN COUNTY.

DAY.—It is the intention of the company not to start its furnace at Bristol for some time yet, but to make a long run when it is started. At the Day mine, sinking for another level has been resumed, and the shaft is now 35 feet below the bottom level. The ore-chamber on the lower level has been cut into at a depth of 30 feet, and it has been ascertained that the ore continues down to at least a depth of 50 feet, and how much farther work alone will show. Work is to be resumed on the Mendha mine at Highland.

STOREY COUNTY—COMSTOCK LODE.

The Leadville *Herald* states that some time ago a number of the most prominent mining and business men of Colorado organized a company, under the laws of California, for the purpose of prospecting for the southern extension of the Comstock vein. A tunnel was surveyed, calculated to intersect the vein at about 1600 feet from its mouth, and at about 900 feet below the outcrop. The tunnel is now in about 1500 feet, approaching the vein from the east side. So far, the work has all been in porphyry, with the exception of a few spurs of quartz, highly mineralized, and returning some very fair assays. The work is facilitated by the aid of machine drills, air-compressor, and other appliances, permitting rapid progress, and it is expected that the banging-wall will soon be pierced, and the vein disclosed in all its strength and wealth. The enterprise is said to be one of the greatest in progress in the Sage Brush State, and, should it result favorably, will prove one of the greatest benefits to Nevada.

At Gold Hill, all mining operation are badly crippled on account of the low stage of water in the Carson River, which prevents the crushing of ore. This trouble will not end till the fall rains set in. Meantime about all that can be done in the mines is exploring and prospecting-work.

ALTA.—The report that some parties were making a determined effort to control the company for the coming year brought a large number of stockholders to the annual meeting held in San Francisco recently. The San Francisco *Exchange* says that fair play and no favor was the motto, and was carried out in spirit and letter. A resolution was passed by the company to allow all stockholders to redeem all stock bought in by the company for fifteen days after purchase of the same by the company. The following trustees were elected to serve for the ensuing year: W. H. Watson, W. F. Myers, W. H. Hoag, J. L. Armstrong, and S. de Greayer. The secretary's report shows:

Balance as per last annual report	$23,437.21
Receipts: Assessments Nos. 24, 25, and 26—25 cents each	80,996.68
	$104,433.89
Disbursements: Labor, supplies, tunnel drift (2362 feet), and all other expenses	60,063.83
Balance	$44,370.06

The balance is represented by various assets, including cash in treasury and on hand, $30,430.53.

NEW MEXICO.

BERNALILLO GOLD PLACER MINING ASSOCIATION.—The owners of the placer claim four miles north of Albuquerque have formed a stock company, to be known by the above name. The capital stock is placed at $250,000, and divided into shares of $250 each. It is proposed in this way to raise sufficient money to purchase machinery. The work of sinking the shaft on the placer is progressing.

COLUMBIA.—The Southwest *Sentinel* states that this mine at Lake Valley was sold to the Sierra Bella Company for $30,500. It is thought, however, the purchase was really for the Sierra Grande Company.

OLD MAN.—Workmen are engaged in placing a tramway in the incline shaft, and this, when completed, will give additional facilities and very materially increase the daily output of ore. Southwest from the shaft, a main or working tunnel has been started, and is said to be in ore already. At present, the company has 400 sacks of ore awaiting shipment, and on the dump there are upward of 1500 tons of milling ore, which will be reserved until such time as the company has completed its ten-stamp mill, now in contemplation.

RICHARDS.—This group of mines, consisting of seven claims, shows well for prospects, and some of the mines are producing ore of a smelting value, notably the Columbia. The shaft at fifty feet in depth exposes some fine ore. At this point, however, the crevice is not looking quite so well, owing to the intrusion of a horse, which promises to yield in a few feet. The Black Prince, at forty-five feet, presents a fine exposure of free-milling rock, estimated at two feet in width. On the dump are several tons of rock of fair milling grade. The Gladstone, belonging to the same group, and situated about three quarters of a mile distant from the Black Prince, is a wide vein of heavy iron ore showing spar.

UTAH.

COMET.—A car-load of ore from this mine, sent to Colorado for treatment, after paying the cost of hauling to Frisco, loading on cars, transportation to Colorado, commissions, etc., netted to the owners over $60 per ton For a single test of one car-load, this did well, and when the company gets its own reduction-works, it expects to get still better returns. It is putting in hoisting-works, which will soon be ready for operation. Drifts are running on the vein, cross-cutting is doing, and general development-work is going on satisfactorily. The prospects of the property improve as work progresses. This property was sold recently to a French syndicate.

BOX ELDER COUNTY.

FRISCO.—The ore continues to improve, and the vein grows larger and richer as depth is gained. There is a large quantity of high-grade ore on the dumps ready for shipment.

SALT LAKE COUNTY.

GERMANIA.—Two stacks are now running on Wood River ores, while a third stack is nearly completed for use. In connection with these works, the company has a sampling-mill, in which it proposes sampling the ores bought by it for reduction, as also for custom work. The refinery is getting into shape, and will soon be in operation on the silver-lead-bullion production of the furnaces. About 250 men will be employed at the first of November next.

SUMMIT COUNTY.

HOPEWELL CONSOLIDATION.—Investigation shows that, although upward of sixty thousand dollars have been expended, there is very little to show for it, and the property is still a mere prospect. It is now proposed to consolidate the Hopewell Consolidation, embracing ten locations, with a number of other properties, and form a combination which embraces twenty-six claims. If this scheme can be successfully consummated, it will include the Nettie B., Forrest, and a number of other valuable properties.

HORN-SILVER.—In this mine, on Horn-Silver Mountain, a large body of high-grade chloride mineral has been struck. The drift has been following a broken and uncertain stringer, which has just opened out into large dimensions. The pay-seam is nine feet thick. Six samples from the different layers in the face of the ore-body average 320 ounces to the ton.

MINNIE WHEELER.—A shaft is sinking to tap the vein. Cabins and other necessary buildings have been prepared, and it is the intention to continue work without interruption. The property lies close to the Crescent property, being separated only by the Union claim, and it lies in a square block 1400 feet wide and 1500 feet long.

VIRGINIA.

The discovery of tin ore near Lexington is reported.

HOUSTON.—About thirty tons of manganiferous iron ore are daily shipped to the Cambria Iron Company of Johnstown, Pa.

KENNEDY.—It is reported that a bed of manganese ore has been found on these iron lands, situated on the westward slope of Western Blue Ridge, Augusta County.

WAGNER.—J. B. White & Co. are sinking a new shaft on this land, about 30 feet from the shaft that was sunk five years ago, from which, at a depth of 26 feet, several hundred tons of good ore were taken.

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par value.	Assessments. Total levied to date.	Assessments. Date and amount per share of last.			Dividends. Total paid to date.	Dividends. Date and amount per share of last.			Highest and Lowest Prices per Share at which Sales were Made. Aug. 25. H.	Aug. 25. L.	Aug. 27. H.	Aug. 27. L.	Aug. 28. H.	Aug. 28. L.	Aug. 29. H.	Aug. 29. L.	Aug. 30. H.	Aug. 30. L.	Aug. 31. H.	Aug. 31. L.	Sales.	§
1	Alice, s. c.	Mont	$10 000,000	400,000	$25	*	.....	.....	.....	$400,000	Dec.	1881	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,200	...
2	Amie Con., s. L.	Colo.	5,000,000	500,000	10	*	.....	.....	.....	305,000	May	1880	.10	.....	.....	.15	.....	.....	.....	.14	.13	.....	.....	.....	.....	.....	...
3	Atlantic, c.	Mich	1,000,000	40,000	25	$280,000	Apl.	1875	$1.00	220,000	Feb.	1883	$2.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	B.
4	Argents, s	Nev..	10,000,000	100,000	100	275,000	Jun.	1883	.25	40,000	Feb.	1880	.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
5	Barbee & Walker, s..	Utah	1,000,000	100,000	10	*	.....	.....	.....	60,000	Nov	1880	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
6	Bassick, G. S.	Colo.	10,000,000	100,000	100	*	.....	.....	.....	200,000	Jun.	1883	1.00	9.25	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	...
7	Belle Isle, s.	Nev..	10,000,000	100,000	100	85,000	May	1883	.20	300,000	Dec.	1879	.25	.30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	600	...
8	Belcher, G. S.	Nev..	10,400,000	104,000	100	2,588,000	Apl	1883	.25	15,397,000	Apl.	1876	1.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	S.F
9	Birdseye, G.	Cal..	.....	15,000	...	.....	.....	.....	.....	.....	Dec.	1882	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
10	Black Bear, G.	Cal..	3,000,000	30,000	100	15,000	Sept	1879	.50	285,000	May	1883	.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
11	Bodie Con., G.	Cal..	10,000,000	100,000	100	225,000	Aug	1883	.50	1,295,000	Nov	1882	.20	.30	.25	.....	.....	.....	.....	.....	.....	.15	.....	.19	.17	1,225	S.F
12	Bonanza Developm't	C & M	3,000,000	300,000	10	.....	.....	.....	.....	135,000	Oct..	1882	.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
13	Boston & Mont, G.	Mont	2,000,000	200,000	10	*	.....	.....	.....	310,000	Jan.	1883	.05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
14	Breece, s.	Colo.	5,000,000	200,000	25	*	.....	.....	.....	2,000	Feb.	1880	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	P.
15	Buiwer, G.	Cal	1,000,000	100,000	100	30,000	Dec.	1877	.50	165,000	July	1883	.15	.....	.....	.....	.....	.....	.....	.70	.....	.....	.....	.....	.....	200	...
16	California, G. S.	Nev..	54,000,000	540,000	100	864,000	Jun.	1883	.20	31,320,000	Dec.	1879	.50	.37	.....	.37	.....	.....	.....	.....	.....	.....	.....	.30	.28	3,400	B.
17	Calumet & Hecla, c.	Mich	2,500,000	100,000	25	.....	.....	.....	.....	23,850,000	Aug	1883	5.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
18	Carbonate Hill, s. L.	Colo.	.....	.....	...	.....	.....	.....	.....	60,000	July	1883	.05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
19	Caribou Con., s.	Colo.	1,000,000	100,000	10	*	.....	.....	.....	50,000	Mch	1880	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
20	Carolina Queen, c.	N. C..	200,000	100,000	2	.....	.....	.....	.....	8,000	Oct.	1882	.02	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
21	Castle Creek, G.	Idah.	100 000	100,000	1	.....	.....	.....	.....	45,000	Aug	1883	.03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	B.
22	Catalpa, s. L.	Colo.	3,000,000	300,000	10	*	.....	.....	.....	240,000	Jun.	1883	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
23	Central, c.	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,670,000	Feb.	1883	3.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
24	Christy, s.	Utah	6,000,000	60,000	100	.....	.....	.....	.....	90,000	Jan.	1883	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	B.
25	Chrysolite, s. L.	Colo.	10,000,000	200,000	50	*	.....	.....	.....	1 600,000	Dec.	1881	.50	1.05	1.00	1.05	.....	.....	.....	1.05	1.00	1.10	1.05	1.15	.....	6,800	...
26	Con. Gold Mining, G.	Ga...	500,000	100,000	5	*	.....	.....	.....	112,000	Aug.	1883	.04	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	S.F.
27	Con. Virginia, G. S.	Nev..	51,000,000	540,000	100	1,005,000	July	1883	.20	42,930,000	Aug.	1880	.50	.65	.62	.....	.....	.....	.....	.65	.64	.65	.63	.63	.60	3,900	...
28	Contention, s.	Ariz.	12,500,000	250,000	50	.....	.....	.....	.....	$2,461,500	Jun.	1883	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
29	Copper Queen, c.	Ariz.	2,500,000	250,000	10	*	.....	.....	.....	1,100,000	July	1883	.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	S.F
30	Crown Point, G. S.	Nev..	10,000,000	100,000	100	2,673,000	Feb.	1882	.25	11,588,000	Jan.	1875	2.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
31	Deadwood-Terra, G.	Dak..	5,000,000	200,000	25	*	..	..	.....	4900,000	Jan.	1883	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	B.
32	Dunkin, s. L.	Colo.	5,000,000	200,000	25	*	.....	.....	.....	200,000	July	1881	07½	.....	.....	.....	.....	.....	.....	.....	.....	.30	.....	.35	.....	700	...
33	Eureka Con., G. S. L.	Nev..	5,000,000	50,000	100	250,000	July	1883	.60	4,767,500	July	1882	.25	.....	.....	.....	.....	6.13	.....	6.88	.....	.....	.....	6.88	.....	215	S.F
34	Evening Star, s. L.	Colo.	500,000	30,000	10	*	.....	.....	.....	1,275,000	Aug.	1883	.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
35	Excelsior, G.	Cal..	10,000,000	100,000	100	360,000	Aug	1883	1.00	875,000	Oct..	1880	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
36	Father de Smet, G.	Dak..	10,000,000	100,000	100	.....	.....	.....	.....	610,000	July	1883	.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
37	Findley	Ga...	.....	.....	...	.....	.....	.....	.....	.....	...	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
38	Franklin, c.	Mich	.....	54,000	...	360,000	Jun	1877	.....	243,000	...	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
39	Freeland, s.	Colo.	5,000,000	200,000	25	*	.....	.....	.....	50,000	May	1880	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
40	Fresno Enterprise, G	Cal..	5,000,000	100,000	50	.....	Mch	1883	.10	110,000	July	1882	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
41	Gem, s.	Colo.	125,000	125,000	1	..	.....	.....	.....	23,750	May	1881	.02	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	S.F.
42	Glass-Peadery, S. L.	Colo.	5,000,000	250,000	20	*	.....	.....	.....	25,000	May	1881	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	S.F.
43	Glen, s.	Colo.	100,000	100,000	1	.....	.....	.....	.....	7 000	May	1883	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
44	Gold Stripe	.....	.....	.....	...	.....	.....	.....	.....	.....	...	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
45	Gould & Curry, G. S.	Nev..	10,800,000	108,000	100	3,530,000	Jun.	1883	.50	3,826,000	Oct.	1870	10 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	S.F.
46	Grand Central, s.	Ariz.	1,000,000	100,000	10	.....	.....	.....	.....	625,000	Dec.	1882	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
47	Grand Prize, s.	Nev..	10,000,000	100,000	100	470,000	Jun.	1883	.25	450,000	Sept	1880	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	700	...
48	Granite, s.	Colo	125,000	125,000	1	.....	.....	.....	.....	6,250	May	1883	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
49	Great Eastern, G.	Dak..	300,000	300,000	1	*	.....	.....	.....	16,000	July	1880	.01	.....	.....	.....	.....	.....	.....	.01	.....	.....	.....	.....	.....	1,000	...
50	Great Western, Q.	al..	5,000,000	50,000	100	35,500	Aug	1873	.15	262,500	Oct..	1882	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
51	Green Mountain, G.	Cal..	1,250,000	125,000	10	*	.....	.....	.....	212,000	Nov.	1881	.07½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
52	Hale & Norcross, G. S	Nev..	11,200,000	112,000	100	4,062,000	Jun.	1883	50	1,598,000	Apl.	1871	5.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
53	Hall-Anderson, G.	N. S.	150,000	150,000	1	.....	.....	.....	.....	7,000	Jan.	1882	.05	.....	.....	1.15	1.10	1.05	.....	.....	.....	1.00	.....	1.05	1.00	2,200	...
54	Hecla Con., S.	Mont	1,500,000	30,000	50	.....	.....	.....	.....	477,500	Aug.	1883	.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	S.F
55	Henriett, L.	Colo.	.....	270,000	...	.....	.....	.....	.....	27,000	Feb.	1883	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	B
56	Hibernia, s. L.	Colo.	7,500,000	300,000	25	*	.....	.....	.....	180,000	July	1881	.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
57	Holyoke, G.	Idah.	200,000	200,000	1	.....	.....	.....	.....	40,000	Aug.	1883	.02	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
58	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	2,062,500	Aug.	1883	.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
59	Hope, s.	Mont	400,000	8,000	50	*	.....	.....	.....	103,124	July	1883	1.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
60	Horn-Silver, s. L.	Utah	10,000,000	400,000	25	*	.....	.....	.....	2,600,000	Aug.	1883	.75	.....	.....	6.75	6.63	7.00	6.75	7.00	.....	7.00	.....	.....	.....	1,670	...
61	Howell S. & M. Co.	Ariz.	375,000	187,500	2	*	.....	.....	.....	3,750	Aug.	1883	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
62	Hukill, G. S.	Colo	1,000,000	200,000	5	*	.....	.....	.....	210,000	Dec.	1878	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
63	Idaho, G.	Cal..	310,000	3,100	100	.....	.....	.....	.....	3,387,750	Aug.	1883	2.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
64	Independence, s.	Nev..	10,000,000	100,000	100	245,000	May	1883	.30	225,000	Sept	1879	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
65	Indian Queen, s.	Nev..	250,000	125,000	2	*	.....	.....	.....	368,750	July	1883	.03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	B.
66	Inyo, G.	Cal..	500,000	100,000	5	*	.....	.....	.....	45,000	Apl.	1882	.05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
67	Iron-Silver, s. L.	Co o	10,000,000	500,000	20	*	.....	.....	.....	1,100,000	Jun.	1883	.20	.....	.....	3.05	.....	.....	.....	3.05	.....	.....	.....	3.00	.....	3,000	S.F.
68	Jocuistitta, s.	Mex.	10,000,000	100,000	100	.....	.....	.....	.....	900,000	Aug.	1883	.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
69	Kentuck	Nev..	3,000,000	30,000	100	342,000	Nov	1881	.30	1,264,000	July	1883	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
70	La Plata, s. L.	Colo.	2,000,000	200,000	10	*	.....	.....	.....	610,000	Sept	1882	.30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	E..
71	Leadville, s. L.	Colo	4,000,000	400,000	10	*	.....	.....	.....	200,000	May	1883	.05	.....	.....	.35	.....	.....	.....	.....	.....	.38	.35	.30	.....	800	...
72	Leeds, s.	Utah	6,000,000	60,000	100	87,000	July	1882	.50	78,000	Oct..	1878	.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	S.F.
73	Little Chief, s. L.	Colo	10,000,000	200,000	50	*	.....	.....	.....	700,000	Aug.	1880	.50	.50	.43	.60	.55	.59	.55	.62	.56	.62	.60	.60	.....	8,700	...
74	Little Pittsburg, s. L	Colo.	20,000,000	200,000	100	*	.....	.....	.....	1,050,000	Mch	1880	.50	.....	.....	.....	.....	.....	.....	.....	.....	.55	.....	.60	.....	300	...
75	Marguerite, G.	Cal..	500,000	25,000	20	.....	.....	.....	.....	18 750	Oct..	1882	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	S.F.
76	Martin White, s.	Nev.	10,000,000	100,000	100	1,000,000	Jun.	1883	.25	90,000	July	1879	.30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	B.
77	Minas Nuevas, s.	Mex	300,000	100,000	3	*	.....	.....	.....	30,000	July	1882	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
78	Morning Star, s. L.	Colo.	1,000,000	100,000	10	.....	.....	.....	.....	500,000	July	1883	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
79	Napa, Q.	Cal..	700,000	100,000	7	.....	.....	.....	.....	200,000	Jan.	1883	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
80	Navajo, G. S.	Nev..	10,000,000	100,000	100	235,000	Mch	1882	.20	225,000	May	1883	.25	.....	.....	.....	.....	3.10	.....	.....	.....	.....	.....	.....	.....	100	...
81	New York Hill, G.	Cal..	5,000,000	50,000	100	55,000	Mch	1878	.20	215,000	Aug.	1882	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
82	New York & Colo., G.	Colo.	1,250,000	50,000	25	.....	.....	.....	.....	25,000	July	1879	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
83	Northern Belle, s.	Nev..	5,000,000	100,000	100	.....	.....	.....	.....	2,400,000	Apl.	1883	.50	6.50	.....	6.50	.....	.....	.....	6.25	6.13	.....	.....	6.25	.....	1,400	B.
84	North Bell Isle, s.	Nev..	10,000,000	100,000	100	95,000	May	1883	.20	30,000	Aug.	1881	.15	.....	.....	.....	.....	.....	.....	.....	.....	.50	.37	6.25	.....	350	...
85	Ontario, s. L.	Utah	15,000,000	150,000	100	.....	.....	.....	.....	4,925,000	Jan	1 83	.50	31 50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	...
86	Ophir, G. S.	Nev..	10,000,000	100,000	100	3,645,000	Aug	1883	1.00	1,595,000	July	1882	1.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	B.
87	Osceola, c.	Mich	1,250,000	50,000	25	480,000	Apl.	1876	1.60	860,000	July	1883	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
88	Oxford, G.	N. S.	100,000	100,000	1	*	.....	.....	.....	3,000	Aug	1883	.05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
89	Pleasant Valley, G. S.	Cal..	10,000,000	100,000	100	15,000	May	1883	.15	30,000	Dec.	1882	.05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	S.F.
90	Polonia, s.	Colo.	200,000	8,000	25	.....	.....	.....	.....	12,000	...	1882	1.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
91	Prussian, s. L.	Colo	1,500,000	150,000	10	.....	.....	.....	.....	132,000	Jan	1883	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
92	Quick liver, pref, Q	Cal..	4,300,000	43,000	100	.....	.....	.....	.....	654,000	July	1882	6.00	.....	.....	.....	.....	.....	.....	34.00	.....	33.00	.....	.....	.....	500	P.
93	" com., Q	'al..	5,700,000	57,000	100	.....	.....	.....	.....	151,000	July	1882	.47	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
94	Quincy, c.	Mich	1,200,000	40,000	25	200,000	Dec.	1862	5.00	3,584,000	July	1883	3.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	S.F.
95	Renfrew, G.	N. S.	60,000	30,000	2	.....	.....	.....	.....	4,50	July	1882	.02	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
96	Richmond, S. L.	Nev..	1,350,000	54,000	2	*	.....	.....	.....	4,042,587	May	1881	1.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	E..
97	Rising Sun, s.	Dak..	750,000	150,000	5	*	.....	.....	.....	52,000	May	1881	.07½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
98	Robinson Bar, G.	Idah.	100,000	100,000	1	*	.....	.....	.....	9,000	Dec.	1882	.03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
99	Robinson Con, S. L.	Colo.	10,000,000	200,000	50	.....	.....	.....	.....	575,000	Nov	1881	.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
100	Robert E. Lee, s. L.	Colo.	250,000,000	500,000	500	.....	.....	.....	.....	100,000	Dec.	18 2	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	E.
101	San Francisco, C.	Cal..	.....	50,000	...	.....	.....	.....	.....	50,000	Jan.	1883	.05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
102	Savage, s.	Nev..	11,200,000	112,000	100	5,544,000	July	1883	.50	4,460,000	July	1869	3.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	B.
103	Shoshone, G.	Idah	150,000	150,000	1	.....	.....	.....	.....	7,500	Apl.	1883	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
104	Sierra Buttes, G.	Cal..	225,000	22,500	10	.....	.....	.....	.....	1,435,308	Apl.	1883	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	E..
105	Sierra Grande, s.	N. M	10,000,000	400,000	25	.....	.....	.....	.....	600,000	Apl.	1883	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
106	Sierra Nevada, G. S.	Nev..	10,000,000	100,000	100	5,350,000	Aug	1883	1.00	102,000	Jan.	1871	1.00	4.00	.....	.....	.....	.....	.....	.....	.....	3.65	.....	4.75	.....	420	P.
107	St. Pimas Eureka, G	Cal.	.....	40,625	...	.....	.....	.....	.....	.....	Apl.	1882	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	P.
108	Silver Cord, G. S. L.	Colo	4,500,000	45,000	10	.....	.....	.....	.....	180,000	Aug	1883	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	S.F.
109	Silver King, S.	Ariz.	1,000,000	100,000	100	.....	.....	.....	.....	1,275,000	Jun.	1883	.25	.....	.....	.....	.....	.....	.....	6.88	.....	.....	.....	.....	.....	100	...
110	Silver King, s.	Colo.	1,000,000	50,000	2	.....	.....	.....	.....	50,000	Aug.	1881	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
111	Smuggler, s. L.	Colo.	600,000	60,000	10	.....	.....	.....	.....	66,700	Aug	1883	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
112	Socorro, c.	N. M.	250,000	2,500	100	.....	.....	.....	.....	4,000	Mch	1882	.00¾	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	B.
113	Spring Valley, G.	Cal.	2,000,000	200,000	1	*	.....	.....	.....	50,000	Jan.	1881	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
114	Standard, G. S.	Cal..	10 000,000	100,000	100	.....	.....	.....	.....	4,200,000	Aug.	1883	.25	.....	.....	5.88	5.75	6.00	5.50	5.50	5.38	5.50	.....	.....	.....	710	...
115	Stormont, s.	Utah	200,000	2 0,000	1	*	.....	.....	.....	155,000	Nov	1881	.05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
116	St. Joseph, L.	Mo..	1,000,000	100,000	10	*	.....	.....	.....	390,000	Dec.	1882	.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
117	Tip Top, s.	Ariz	10,000,000	100,000	100	225,000	Aug	1883	.25	100,000	Nov	1881	.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
118	Tombstone, G. S.	Ariz	12,500,000	500,000	25	*	.....	.....	.....	1,250,000	Apl.	1882	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	B.
119	True Fissure, G. S. L.	Utah	1,500,000	150,000	10	*	.....	.....	.....	75,000	Jan.	1883	.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
120	United Gregory, G.	Colo	300,000	300,000	1	.....	.....	.....	.....	28,250	Apl.	1884	.25	..

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. Number.	Shares. Par Value.	Assessments. Total levied to date.	Assessments. Date and amount per share of last.			Highest and Lowest Prices per Share at which Sales were Made. Aug. 25. H.	Aug. 25. L.	Aug. 27. H.	Aug. 27. L.	Aug. 28. H.	Aug. 28. L.	Aug. 29. H.	Aug. 29. L.	Aug. 30. H.	Aug. 30. L.	Aug. 31. H.	Aug. 31. L.	Sales.	
1	Advance M & M. Co.																						
2	Albion, S. L.	Nevada	$15,000,000	150,000	$100	$622,500	July	1883	.50														S. F.
3	Allouez, C.	Michigan	2,000,000	80,000	25	200,000	January	1883															B.
4	Alpha Con., G. S.	Nevada	3,000,000	30,000	100	420,000	March	1882	.50														S. F.
5	Alta, S.	Nevada	10,080,000	100,800	100	2,137,200	July	1883	.25														S. F.
6	Alta-Montana, G. S. L.	Montana	5,000,000	500,000	10													.06		.06		1,100	
7	American Flag, S.	Colorado	1,250,000	125,000	10	300,000	June	1877	.25														
8	Barcelona, G.	Nevada	5,000,000	200,000	25	*				.32	.30	.31	.30	.31	.30	.30				.33	.32	7,200	
9	Battle Creek																						
10	Bear Creek	California	300,000	300,000	1																		
11	Beauce																						
12	Bechtel Con., G.	California	10,000,000	100,000	100	185,000	January	1883	.10														S. F.
13	Best & Belcher, G. S	Nevada	10,080,000	100,800	100	1,306,190	May	1883	.50														S. F.
14	Big Pittsburg, S. L.	Colorado	20,000,000	200,000	100	*																	
15	Black Jack, G.	California	250,000	100,000	2½																		
16	Bonanza Chief	Montana	1,000,000	1,000,000	1	*																	
17	Bonanza King, Cons.	California	2,000,000	200,000	10	*																	
18	Bondholder	Colorado	500,000	200,000	2½				.25														
19	Boston Con., G	California	10,000,000	100,000	100	95,000	October	1882															
20	Boulder Con.	Colorado																					
21	Bradshaw, S.	Arizona	2,250,000	225,000	10																		
22	Buckeye	Colorado	2,000,000	400,000	5	*																	
23	" preferred	Colorado																					
24	Bull Domingo, S. L.	Colorado	10,000,000	200,000	50	*																	
25	Bullion, G. S.	Nevada	10,000,000	100,000	100	3,767,000	May	1883	.20														S. F.
26	Bye and Bye	Arizona	1,000,000	100,000	10	*																	
27	Calaveras, G.	California	500,000	500,000	1	*																	
28	Cal. W'r & M. Co, G.	California																					
29	Caledonia, B. H., G.	Dakota	10,000,000	100,000	100	480,000	August	1882	.15			.70		.55								200	
30	Catskill, S.	Nevada	1,500,000	300,000	5																		
31	Central Arizona, S.	Arizona	10,000,000	100,000	100													.28	.19	.25		1,750	B.
32	Chapparal	California																					
33	Cherokee, G.	California	1,500,000	150,000	10																		
34	Chollar, S.	Nevada	11,200,000	112,000	100	633,000	August	1883	1.00														S. F.
35	Climax									.09		.10		.10				.09				1,600	
36	Colorado Central, S.	Colorado	3,000,000	300,000	10																		
37	Columbia Con., G. S.	Nevada	5,000,000	100,000	50																		
38	Con. Imperial, G. S.	Nevada	50,000,000	500,000	100	1,450,000	May	1883	.05														
39	Con. Pacific, G.	California	6,000,000	60,000	100	156,000	March	1883	.15														
40	Crescent, S. L.	Colorado	3,000,000	300,000	10	*																	B.
41	Crowell, G.	North Car.	500,000	500,000	1																		
42	Dahlonega, G.	Georgia	250,000	250,000	1	*																	
43	Dardanelles, G.	California	1,000,000	100,000	10																		
44	Decatur									.03						.02		.02				5,500	
45	Dunderberg, S.	Colorado	1,500,000	150,000	10	*																	
46	Durango, G.	Colorado	500,000	500,000	1	*						.05										800	
47	Eastern Oregon									.95	.89	.90	.89	.85		.83		.83	.81	.82	.78	4,100	
48	Elko Con., S.	Nevada					April	1883	.15							.10		10		.10		1,700	
49	Empire, S.	Utah	10,000,000	100,000	100																		B.
50	Enterprise	Colorado																					
51	Exchequer	Nevada	10,000,000	100,000	100	650,000	June	1883	.20														
52	Fannie Barret, S.	Colorado																					
53	Globe Copper	Arizona																					
54	Gold Placer, G.	Colorado	5,000,000	200,000	25	*																	
55	Goodshaw, G.	California	10,000,000	100,000	100	210,000	June	1883	.10														
56	Granville,	North Car.	300,000	300,000	1	*																	
57	Harlem M. & M. Co, G.	California																					B.
58	Harshaw, S.	Arizona	10,000,000	100,000	100																		
59	Head Center, S.	Arizona	5,000,000	200,000	25	160,000	May	1882	.20														
60	Hortense, S.	Colorado	2,000,000	200,000	10																		
61	Julia, G. S.	Nevada	11,000,000	110,000	100	1,405,000	April	1883	.10														
62	Kossuth, G. S.	Nevada	10,800,000	108,000	100	421,200	August	1877	.15														
63	Lacrosse, G.	Colorado	1,000,000	100,000	10	*				.08												1,000	
64	Leviathan, S.	Nevada	10,000,000	100,000	100	380,000	September	1882	.25														
65	Lucerne, S.	Colorado	5,000,000	500,000	10	*																	
66	Mariposa pref., G.	California	5,000,000	50,000	100	1,687,500	December	1881															
67	" common, G.	California	10,000,000	100,000	100	1,975,000	February	1883	.25														
68	May Belle, G.	California	10,000,000	100,000	100	84,000	December	1881	.20														
69	Mayflower, S.	Colorado	10,000,000	100,000	100	*																	
70	Mexican, G. S	Nevada	10,000,000	100,800	100	2,319,400	July	1883	.50														S. F.
71	Michoacan Synd.	Mexico																					
72	Miner Boy, G. S. L.	Colorado	5,000,000	500,000	10	*																	
73	Miller	Nevada	5,000,000	200,000	25																		
74	Mono, G.	California	5,000,000	50,000	100	535,000	January	1883	.20														S. F.
75	Moose Silver, S.	Colorado	3,000,000	300,000	10	*																	
76	Moulton, G. S.	Montana	10,000,000	400,000	25	*																	
77	Nevada Syndicate																						
78	North Standard, G	California	10,000,000	100,000	100	20,000	November	1881	.10	.08												2,000	
79	North Horn-Sil., S. L	Utah		400,000																			
80	Noonday	California		60,000	10	208,000	December	1882	1.00														S. F
81	Old Dominion, C.	Arizona	3,000,000	300,000	10	*																	
82	Oriental	Nevada	2,000,000	200,000	10																		
83	Oriental & Miller, S.	Nevada	10,000,000	400,000	25																		
84	Overman, G. S.	Nevada	11,520,000	115,200	100	3,604,700	May	1882	.25														S. F.
85	Parnell																						
86	Potosi	Nevada	10,200,000	112,000	100	612,640	August	1883	.25														S. F.
87	Quartz Creek				100																		
88	Rappahannock, G.	Virginia		250,000		*																	
89	Red Elephant, S.	Colorado	500,000	500,000	1	*																	
90	Retort M. & M. Co.	Colorado			10																		
91	San Pedro, G. S. L.	New Mex.		400,000																			
92	Silver Cliff, S.	Colorado	5,000,000	200,000	25	*				.12												100	B., P
93	Silver Isle	Canada	1,000,000	40,000	25																		
94	Sonora Con.	Mexico								.25		.26	.24	.28	.25	.29	.27	.29	.27	.28	.27	40,400	
95	South Bodie, G.	California		100,000		100,000	March	1882	.15														
96	South Bulwer, G.	California	10,000,000	100,000	100	195,000	May	1881	.25														
97	South Hite	California	10,000,000	100,000	100		January	1883	.05													6,200	
98	South Pacific	California			5																		
99	State Line, No. 1, S.	Nevada	200,000	200,000	1																		B.
100	" No. 2, S.	Nevada	5,000,000	200,000	25																		
101	" No. 3, S.	Nevada	5,000,000	200,000	25																		
102	" No. 4, S.	Nevada	5,000,000	200,000	25																		
103	" Nos. 1 and 4, S.	Nevada			25																		
104	" Nos. 2 and 3, S.	Nevada																					
105	Sullivan, G. S. L.	Maine	500,000	100,000	5	125,000	December	1882	.25														
106	Sutro Tunnel	Nevada		2,000,000		*				.19				.20	.19	.20	.19	.19		.19		8,900	B.
107	Taylor-Plumas	California			10																		B., P
108	Tioga, G.	California	10,000,000	100,000	100	285,000	October	1882	.10														
109	Tuscarora, S.	Nevada	10,000,000	100,000	100	110,000	October	1881	.15														
110	Unadilla, S.	Colorado	50,000,000	500,000	100	*																	
111	Union Con., G. S.	Nevada	10,000,000	100,000	100	1,670,000	July	1883	.50									5.25				35	
112	Utah, S.	Nevada	2,000,000	20,000	100	1,420,000	July	1883	1.00														S. F.
113	Vandewater	Nevada	20,000,000	200,000	100	*																	
114	Washington	Arizona	2,000,000	200,000	10																		
115	Whalen Copper	Nevada	2,500,000	100,000	25																		
116	Wide West																						
117	Willshire	California	250,000	50,000	5	*																	

G. Gold. S. Silver. L. Lead. C. Copper. * Non-assessable. † Stocks quoted on S. F. San Francisco; B., Boston; P., Philadelphia. Non-Dividend shares sold, 78,085. Total shares sold, 155,652.

small transaction, sold at $5.25. Sutro Tunnel was quiet and steady, selling from 20@19c.

The Leadville stocks were moderately dealt in and were a little strong. Amie was quiet and steady at 15@13c. Chrysolite had a fair business and showed some strength; it sold from $1@$1.15. Dunkin was quiet and steady at 30@28c. Iron Silver sold from $3.05@$3, with a small business. Leadville was quiet and a little weak, selling from 38@30c. Little Chief had an active business, and was quite strong; it sold from 43@62@60c. Little Pittsburg was also strong, selling from 55@60c.; the transactions were small. Climax was moderately dealt in at steady prices, selling from 10@9c.

The Bodie stocks were quiet and showed signs of weakness. Bodie Consolidated was quiet and weak, selling at 67c. assessment paid, and from 30@15@17c. assessment unpaid. Standard had a small business at irregular prices; it sold from $6@$5.38@$5.50. Bulwer was quiet and steady at 70c. North Standard sold at 8c.

The Tuscarora stocks were very quiet and were steady. Grand Prize sold from 25@20c., with small transactions. Belle Isle recorded a small busi-

ness at 30c. Navajo sold to the extent of 100 shares at $3.10. North Belle Isle exhibited considerable strength under a small business, selling from 37@50c. Elko Consolidated was quiet and steady at 10c.

In the miscellaneous list, Eureka Consolidated was quiet and strong, selling from $6.13@$6.88. Hall-Anderson recorded a small business at irregular prices, selling from $1.15@$1@$1.05. Horn-Silver was moderately dealt in at strong prices; it sold from $6.63@$7. Northern Belle was irregular, under a fair business, selling from $6.50@$6.13@$6.25. Robinson Consolidated was very active and very irregular; it sold from 45@54@46c. Sierra Grande recorded a fair business, and was also irregular; it sold from $1@$1.20@$1.05.

Alta Montana was quiet and steady at 6c. Caledonia sold from 70@55c. under a small business. Central Arizona was quite strong, under small transactions, selling from 19@28@25c. Decatur had a small business at weak prices, selling from 3@2c. Eastern Oregon suffered a decline from its recent strong prices and was quite weak; it sold from 95 78c. Rappahannock was quiet and steady at 7 6c. Sonora Consolidated was very active at steady prices; it sold from 24@29@27c.

DIVIDENDS.

The Charleston Mining and Manufacturing Company, of South Carolina, announces a quarterly dividend of two dollars and fifty cents per share, payable September 1st.

The Evening Star Mining Company, of Colorado, has, according to Leadville papers, declared dividend No. 55, payable August 22d, and amounts to fifty cents a share, aggregating $25,000. Total dividends paid to date, $1,375,000.

The Mount Diablo Mining and Milling Company, of Nevada, has declared a dividend (No. 1) of twenty-five cents per share, payable at San Francisco, August 23d.

DIVIDENDS PAID BY MINING COMPANIES DURING THE MONTH OF AUGUST, AND FROM JANUARY 1ST, 1883.

NAME OF COMPANY.	Location of mines.	Paid during month of August.	Since January 1, 1883.
Atlantic, C.	Mich.		$80,000
Bassick, S.	Colo.		200,000
Black Bear, G.	Cal.		6,000
Boston & Montana, G.	Mont.		10,000
Bulwer Consolidated, G.	Cal.		35,000
California, G.	Colo.	32,500	65,000
Calumet & Hecla, C.	Mich.	500,000	1,500,000
Carbonate Hill, S.	Colo.		60,000
Castle Creek, G.	Idaho.	3,000	27,000
Catalpa, S.	Colo.		30,000
Central, C.	Mich.		60,000
Christy, S. L.	Utah.		6,000
Colorado United, S.	Colo.		16,750
Contention, S.	Ariz.		375,000
Con. Gold M. Co. of Ga.	Ga.	4,000	32,000
Copper Queen, C.	Ariz.		375,000
Cosmopolitan.	Utah.		50,000
Crescent, C.	"		60,000
Deadwood-Terra, G.	Dak.		20,000
Evening Star, S. L.	Colo.	25,000	50,000
Father de Smet, G.	Dak.		80,000
Gem, S.	Colo.		7,500
Glen, S.	"		3,000
Granite, S.	"		3,750
Hecla, S.	Mont.	15.000	120,000
Henriett, S.	Colo.		27,000
Holyoke, G.	Idaho.	4,000	32,000
Homestake, G.	Dak.	50,000	400,000
Hope, S. C. L.	Mont.		24,000
Horn-Silver, S. L.	Utah.	300,000	900,000
Howell S. & M. Co., G. S. L.	Ariz.	3,750	3,750
Idaho, G.	Cal.	7,750	62,000
Indian Queen	Nev.		3,750
Indian Spring Drift.	Cal.		1,000
Iron Silver, S. L.	Colo.		200,000
Jocuistita, S.	Mexico.	50,000	150,000
Kentuck, S.	Nev.		21,000
Leadville Consolidated, S.	Colo.		40,000
Lexington, S.	Mont.		200,000
Morning Star, S. L.	Colo.		25,000
Navajo, G. S.	Nev.		125,000
Northern Belle, S.	"		100,000
Ontario, S. L.	Utah.		75,000
Osceola Consolidated, C.	Mich.		75,000
Oxford, G.	N. S.	5,000	30,000
Plymouth Cons.	Cal.	50,000	150,000
Prussian, S. L.	Colo.		15,000
Quincy, C.	Mich.	140,000	380,000
Richmond, S. L.	Nev.	67,500	270,000
San Francisco, C.	Cal.		2,500
Shoshone, G.	Idaho.		6,000
Sierra Buttes, G.	Cal.		30,625
Sierra Grande, S.	New Mex.		400,000
Silver Cord, G. S. L.	Colo.	90,000	180,000
Silver King, S.	Ariz.		150,000
Smuggler, S.	Colo.	15,000	36,000
Standard Cons., G.	Cal.	25,000	200,000
Total Wreck.	Ariz.		50,000
True Fissure, G. S. L.	Utah.		75,000
United Gregory, G.	Colo.		12,000
		$1,387,500	$7,721,625

G., gold. S., silver. C., copper. L., lead. N., nickel. Q., quicksilver.

MEETINGS.

Amie Consolidated Mining Company, No. 31 Broad street, New York City. Annual meeting of stockholders and election of trustees, September 15th.

PIPE LINE CERTIFICATES.

Messrs. Watson & Gibson, No. 49 Broadway, report that the petroleum market during the past week sold down to $1.05¾, gradually sagging from $1.08⅛, the opening last Friday, reacting to $1.08⅛, the opening to-day.

The principal reason for the weakness was that reports of development-work in the oil regions for August promised to be very bearish. The report that comes to hand to-day is less bearish than anticipated, hence the improved tone to the market. The report is as follows:

	Wells completed.	Wells drilling.	Rigs up and building.	New production.
July	260	262	232	3,800
August	309	315	261	4,267
August increase.	49	53	29	467

The high price of oil in June and July stimulated drilling of wells, and there are more wells now under way than for six months. With all these wells in view, and several of them important test-wells to the northeast of Balltown, it is unreasonable to expect any material advance. The charters for export have been large, but these must decline. For August there are 47,681 barrels, against 49,458 in May, 46,670 in June, and 39,634 in July. The "runs" up to the 28th inst. exceed the deliveries by 1300 barrels per day, but the accumulation of oil in August will be insignificant compared with the accumulation of 400,000 barrels in July. Refined oil is 7¾ against 7⅝ Wednesday. The petroleum market during the week has generally been dull, the short interest is not large, and the immediate fluctuations are likely to be within a narrow range.

The following table gives the quotations and sales at the New York Mining Stock and National Petroleum Exchange:

	Opening.	Highest.	Lowest.	Closing.	Sales.
Aug. 25	$1.07⅛	$1.07⅛	$1.06¼	$1.07	1,674,000
27	1.07⅛	1.07⅜	1.06¼	1.06⅜	1,842,000
28	1.06⅛	1.06⅜	1.05¾	1.05⅞	2,084,000
29	1.06⅛	1.07⅛	1.06⅛	1.07¼	1,682,000
30	1.07¼	1.08¼	1.07⅜	1.07¾	2,112,000
31	1.08⅛	1.08⅝	1.07⅝	1.08⅝	2,264,000
Total sales					11,658,000

SAN FRANCISCO MINING STOCK QUOTATIONS.

Daily Range of Prices for the Week.

NAME OF COMPANY.	CLOSING QUOTATIONS. Aug. 24.	Aug. 25.	Aug. 27.	Aug. 28.	Aug. 29.	Aug. 30.
Albion						
Alpha		2¼		2⅛	2⅛	
Alta	.80	.80	1	1	1	1⅛
Argenta			.25	.20	.10	
Bechtel						
Belcher		1	1	1	1	
Belle Isle		.25		.25	.30	
Best & Belcher	4¼	4¼	4¼	4¼	4¼	
Bodie		.25	.25	.25	.10	
Bullion						
Bulwer						
California	.40	.40	.35	.35	.30	
Challar	3⅛	3⅛	2⅝	2⅝	2¼	
Con. Virginia	.65	.70	.65	.65	.60	
Crown Point	1⅛	1⅛	1⅛	1⅛	1⅛	
Elko Cons						
Eureka Cons	6½	7	6¾	6¾	6⅝	
Exchequer						
Gould & Curry	3⅛	3¼	3⅛	3⅛	3	
Grand Prize	.25	.25		.25	.20	
Hale & Norcross	6⅛	6⅛	5¾	5¾	4⅞	
Independence						
Martin White		.25		.25		
Mexican	3¾	3⅝	3⅝	3⅝	3¾	
Mono						
Mount Diablo	4¼	4¼	4¼	4¼	4¼	
Navajo	3	3⅛	3	3	3	
Northern Belle			6⅛	6⅛	6⅜	
North Belle Isle						
Ophir	3	3	3¾	3¾	3⅞	
Overman						
Potosi	1⅛	1⅛	1	1	1	
Savage	2½	2⅝	2⅝	2⅝	2⅛	
Scorpion	.65	.60	.60	.60	.65	
Sierra Nevada	4¼	4⅛	3¾	3¾	3¾	
Silver King						
Tip-Top						
Union Cons	5⅝	5⅝	5½	5⅛	5¼	
Utah	3	3⅛	3	3	3	
Wales Cons.						
Yellow Jacket	3¼	3¼	3⅛	3⅛	3¼	

Copper and Silver Stocks.

Reported by C. H. Smith, 15 Congress street, Boston, Stock Broker and Member of the Boston Mining and Stock Exchanges.

BOSTON, August 30.

There is no improvement to note in the market for copper stocks, either in point of activity or prices. To say that the market is dull, feebly expresses the situation. There is, in fact, so little doing that it is almost impossible to get fair quotations, and the few sales recorded from day to day hardly give enough to form an opinion as to the future of business in this line of securities. Ingot copper holds its own very fairly, and, if it should advance from present prices, a change in the market for the principal producing mining stocks would surely follow. The situation is one of waiting and expectation. Calumet & Hecla sold early in the week at $240 and declined to $237, with sales again to-day at $240, and the stock is offered at that price; no bids. The whole amount sold was less than 25 shares, and shows how sensitive the market is. An order to buy 50 shares could not be filled without advancing the price several points; and the reverse, in case the order was to sell at best price. Quincy is steady at $45, all the sales being made at that figure. Less than 100 shares changed hands, and $44 is bid freely, without calling it out. Osceola declined from $18½ (August 14th) to $17¾, with later sales at $18, and closes $17½ bid, $18 asked. Allouez sold at $1¾, an advance of $¼ since last sale (August 14th). Franklin, Pewabic, and Huron are entirely neglected.

In silver stocks, there was a slight increase in the volume of sales at the regular Board over last week, confined, however, to two or three stocks, without any special change in prices. Sullivan sold as before at 87½c. At the Mining Board, sales are recorded at 95@77½c. Catalpa sold at 37½c., a decline of 2½c. Crescent is offered at 15c. without takers. We hear a rumor that Crescent is in debt to the Catalpa, and that the prospects of a dividend from the latter are not very promising. Bonanza declined to 1½c. Harshaw sold at 50c. as before. San Pedro, at 17c. Bowman Silver is slightly higher; sales at 18@19c. Massachusetts & New Mexico is dull at 4@5c. Silver Islet declined from $3⅛@$3.

3 P.M.—There was no change in the market at the afternoon Boards. Calumet & Hecla sold at $240, same as before. Pewabic, at $3¼ regular, and $3.50 buyer 60 days. For Franklin, $9½ bid, $10 asked. Quincy, $44 bid. Atlantic, $10 bid. Osceola, $17½@$18. Silver Islet, $3 bid. Bonanza, $1½ bid. Bowman sold at 18c. Sullivan, 81¼c. bid; sales 85c., buyer 30. Dunkin, 28c. bid.

BULLION MARKET.

NEW YORK, Friday Evening, Aug. 31.

The market abroad has continued fairly steady the past week; but owing to large receipts here and declining sterling exchange, our market has been nominal and weak at the rates of accompanying table:

DATE.	London. Pence.	N. Y. Cents.	DATE.	London. Pence.	N. Y. Cents.
Aug. 25	50⅝	110¼	Aug. 29	50⅝	110@110⅛
27	50⅝	110⅛	30	50⅝	110
28	50⅝	110⅛	31	50⅝	109⅞

Bullion Receipts at New York.—The bullion received from the mines at the various offices in this city during the week ended August 31st, as compiled from various sources, amounted to $222,000, as against $214,000, reported for the previous week. The receipts from January 1st, 1883, to date are $7,613,974.

Exports and Imports of Gold and Silver at New York.

Exports.

Week ended August 25th	$581,605
Corresponding week last year	462,849
Since January 1st, 1883	8,913,129
Corresponding period last year	43,211,547

Imports.

Week ended August 25th	$1,380,941
Corresponding week last year	13,690
Since January 1st, 1883	9,602,774
Corresponding period last year	2,383,652

Foreign Bank Statements.—The governors of the Bank of England, at their regular weekly meeting, made no change in the bank's minimum rate for discount, and it remains at 4 per cent. During the week, the bank gained £395,000 bullion, and the proportion of its reserve to its liabilities was raised from 46 11-16 to 49 9-16 per cent, against 39 3-16 per cent at this date last year. The bank made an additional gain of £75,000 bullion on balance. No report of the weekly statement of the Bank of France has been received.

BOSTON MINING STOCKS.

	Aug. 24.		Aug. 25.		Aug. 27.		Aug. 28.		Aug. 29.		Aug. 30.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Allouez							1.75		1.75				200
Amie													
Atlantic													
Aztec													
Bodie Con													
Bonanza D	1.50						1.63	1.50	1.50		1.56¼	1.50	700
Bowman Sil	.17		.18	.17	.18		.17		.16		.18		14,600
Bruns. Ant													
Bulwer													
California													
Cal. & Hec	240						237½	237			240	238	32
Calalpa	.37½		.40		.37	.36			.37½		.37½	.35	4,600
Central Ariz													
Climax													
Co. Virginia	.67												200
Copper F'lis													
Copperop													
Crescent	.15				.17		.15						600
"Cusi"													
Decatur													
Deer Isle			.05		.05		.04				.05		5,150
Denver City													
Douglas													
Duncan													
Dunkin			.25		.25				.28		.29		1,200
Empire					.16				.16				1,300
Eureka Con											7.00		12
Franklin							9.75						15
Gila County											.08		1,000
Harshaw	.59						.50		.50				560
Hukill													
Independ'ce													
Indian Q'n													
Little Pitts													
Mammoth					.03		.02		.03				2,750
Mass.& N.M.	.05				.05				.05		.05		6,250
Milton													
Napa													
National													
North. Belle													
Ontario													
Osceola			18.00		17.50				18.00				68
Penn-Breck													
Pewabic											3.25		200
Pine Tree													
Plymouth													
Quicks.,com													
Quincy			45.25	45.00	45.00		45.50						120
Robinson	.60						.62				.63		400
San Pedro	.17	.15			.17						.18		1,650
S'ra Nevada													
S'ra Grande													
Silver Islet									3.00				5
Silver King													
Simpson Gd													
So. Pacific													
Standard											7.75		5
Sullivan	.95	.87½	.87½		.85		.92½	.90	.80	.77	.81¼	.81	4,150
Sutro Tun			.20				.20				.19		450
Sycamore													
Twin Lead	.05				.04								2,000
Vizina													

PHILADELPHIA MINING STOCKS.

	Aug. 24.		Aug. 25.		Aug. 27.		Aug. 28.		Aug. 29.		Aug. 30.		Sales
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Amer. Cons.													
Argent	.15		.15								.14		.15	.14	10,050
Aztec															
Battle Mt	.03				.03										6,000
Buena															
California															
Calista															
Chrysolite															
Cincinnati			.10								.10				2,000
Comprom'e							.16				.16		.16		5,600
Contention															
Con. Virg															
Dauntless			.02				.02						.02		5,500
Del Monte	.04				.04										4,000
Denver City					.11								.11		5,000
Eureka															
Girard															
Governor													.04		5,000
Grand Uni'n	.02		.03		.03		.03	.02	.03				.03		20,000
Green Mt															
Gunnison					.30		.27½		.27½				.27½		8,500
Homestake															
Horn Silver															
Iowa Gulch			.06	.05	.06								.06	.05	13,400
Iron Silver															
King Bul'on															
Ledger Con															
Little Dia'd			.06		.07		.06		.06				.07		13,000
Little Maud															
Little Pitts															
L'g & D'y H															
Montana															
Mt.Sheridan	.04						.03						.03		6,000
National															
North'n B'l															
Orion															
Orion Pref															
Palmetto E															
Pembina													.12		1,000
Penn-Breck	.09				.09								.10		7,700
Permanent	.02														5,000
Pizarro	.01														1,000
Pizarro Ex	.03	.02													10,300
Potosi															
Rara Avis													.21		900
Rara Avis E	.10		.12	.11	.12		.11						.12	.11	15,800
Record															
Rico Pion'r															
Sierra Apac					.53								.24		500
Sierra Be.la			.60		.57½								.57½		2,250
Sierra G'nde			1.12½	1.07½	1.07½		1.10	1.05					1.10	1.07½	5,550
Sierra Nev															
Silver Cord			1.60	1.55			1.55								1,700
Silver King					.02		.02		.01						52,000
Sonora Con															
Standard															
Sultana					.02		.03		.02						15,000
Sutro Tun'l															
Tombstone															
Victor															
Yale Mt															

BULLION PRODUCTION FOR 1883.

MINES.	States.	Month of July.	Year from Jan. 1st, 1883.
*Alice, G. S.	Mont	‡$97,128	$568,441
*Alta-Montana, G. L. S.	"		$10,625
*Belmont	"	—	12,604
Bodie, G. S.	Cal	12,447	161,728
Bodie Tunnel, G.	"		52,742
*Bonanza King, G.	"	45,211	379,434
*Boston & Montana, G.	Mont		72,318
*Central Arizona, S.	Ariz		35,845
*Christy, S.	Utah	16,842	162,513
*Chrysolite, S. L.	Colo		246,676
Consolidated Bobtail	Colo		18,723
*Contention, S.	Ariz	77,985	635,413
Crescent, G.	Cal		13,000
*Custer, G. S.	Idaho		43,572
*Deadwood-Terra, G.	Dak		172,277
*Derbec Blue Gravel, G. S.	Cal	17,122	72,270
Dunkin, S. L.	Colo		32,015
Evening Star, S. L.	Colo		47,061
*Father de Smet, G.	Dak	30,688	208,851
*Frisco M. and S. Co., G. S. L.	Utah		§77,084
Gunnell, S	Colo		58,828
*Head Center Consolidated	Ariz		26,502
*Head Center and Tranquillity	Ariz		60,620
*Hecla Consolidated, G. S.	Mont		293,922
*Homestake, G.	Dak		419,148
*Hope, S.	Mont	20,484	62,447
Horn-Silver, S. L.	Utah	300,000	1,847,000
*Howell S. and Mg. Co., G. S. L.	Ariz	§41,361	41,361
Idaho, G.	Cal		88,642
*Independence, G. S.	Nev	—	32,991
Iron Silver, S. L.	Colo		503,831
*Jocuistita, S.	Mex		‡228,022
*Kentuck, G. S.	Nev		12,876
*Lexington, S.	Mont	106,068	744,556
*Little Pittsburg, S. L.	Colo	6,446	42,091
*Marguerite, G.	Cal		45,745
*Martin White, G. S.	Nev	—	136,317
Morning Star, S. D.	Colo		84,428
*Moulton, G. S.	Mont		123,288
Mount Diablo	Nev	74,277	262,100
*Navajo, G. S.	"		411,642
*North Belle Isle	"		2,153
Northern Belle, S.	"	51,134	447,040
*Ontario, S. L.	Utah		1,038,687
*Oxford, G.	N. S.	5,276	40,531
*Phœnix, G.	S. C.	3,000	10,700
*Pinal Consolidated, S. L.	Ariz		181,485
*Satemo, G.	N. S.		2,500
*Silver Bow, G. S.	Mont		101,241
*Silver Cord, G. S. L.	Colo	69,359	703,333
Standard, G.	Cal	95,209	738,401
Star, S.	Nev		27,095
*Stormont, S.	Utah	18,020	132,330
Syndicate, G.	Cal	9,300	38,428
Tintic M. and M. Co.	Utah	10,595	25,196
*Tip Top, S.	Ariz	10,009	37,868
*Tombstone, G. S. L.	"	82,960	497,190
Wyoming Consolidated	Cal		31,541
Yellow Jacket, S	Nev	72,227	265,885
Total amount of shipments to date			$12,871,150

* Official. † Net value. ‡ Assay value. § Not including value of lead. *G. Gold. S. Silver. L. Lead.*

METALS.

NEW YORK, Friday Evening, Aug. 31.

Copper.—Though quiet, the market exhibits considerable firmness, the only supplies of Lake copper available being from second hands. We note sales from of 250,000 to 300,000 pounds of Lake copper at 18⅛@18¼c. Many buyers indicate their willingness to take Lake at 15c., but there is little offering. Other kinds are naturally scarce, and the range remains 14½@14½c., according to brand.

A determined effort is apparently making to create the impression that almost under any circumstances the statistical position here warrants higher prices. There is no doubt that it is favorable, but the fact should not be forgotten that we are down to the world's market. We can not for any length of time maintain a much higher range of prices. A rise here, not accompanied by a corresponding rise abroad, could only be short-lived. It would simply divert into this market furnace material which now goes abroad, and the equilibrium would be quickly restored. If this quantity of copper which could thus be shifted were small and readily controlled, we might part company with the rest of the world. But it is heavy and would promptly force us down to the general level. This fact should be constantly borne in mind. No figuring can brush it aside.

The latest English cables are £63 15s. for Chili Bars and £69 for Best Selected.

Under date of August 17th, Messrs. Henry R. Merton & Co., of London, report:

American ingot copper has been sold at £63@£63 5s. net c. i. f. Liverpool for Orford, and £63 15s. for Baltimore. In Furnace stuff, the transactions have been 350 tons ordinary Rio Tinto Precipitate at 12s. 9d., 150 tons rich Rio Tinto Precipitate at 12s. 10½d., 450 tons Cape ore at 12s. 6d.; and at the Swansea Ticketing, 958 tons ores, averaging 9⅝ per cent, realized 11s. 3¾ d. per unit.

Tin.—Business has been quiet at 21c. for spot Straits. The arrivals during the month have aggregated 1700 tons, of which 300 tons are now on the dock.

London cables £93 12s. 6d.@£93 15s.

Lead.—Sales at the lower figures noted in our last having ceased, apparently because even they did not tempt buyers, and there being simultaneously a disposition on the part of Western holders to pick up cheap lead, the price has advanced to 4·30c., at which jobbing lots aggregating 300 tons have been placed. The firm attitude of holders makes it impossible to procure lead at a lower figure, and yet an effort to place large lots would promptly lead to a heavy falling off in the price. The situation seems to be largely artificial, a dead-lock, in which the sellers' side is at some disadvantage, because of the accumulation of stocks. Nothing is reported in Refined. In London soft Spanish has reached £12 7s. 6d.

From St. Louis, Messrs. John Wahl & Co. wire as follows:

The market remains the same, if anything, a shade firmer. We note sales of 500 tons of Refined, September delivery, at 4·05c., and 130 tons of ordinary Missouri has been sold here to Eastern consumers at 4c.

Messrs. Everett & Post telegraph us to-day from Chicago as follows:

Buyers, fearing an advance, are coming forward and are buying lead quite liberally, so that there has been a large demand for spot lead during the past few days. Our market is strong and higher at 4·07½, 4·10, and 4·12½c.

Spelter.—The cheap lots by weaker producers are disappearing; and while there have been sales at 4⅝@4½c., it would probably be somewhat difficult to obtain supplies at the lower figure. England cables £15 for Silesian.

Antimony.—This metal is quiet, with nothing to report.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Aug. 31.

American Pig.—Business has been restricted to small lots, buyers pursuing strictly a hand-to-mouth policy. No. 1 Foundry continues firm at $21.50@$23 for standard and choice, while No. 2 is still in a less favorable position, showing occasional signs of weakness. We quote $19@$21, according to quality, while inferior to choice Gray Forge fetches from $18 @$20, all at tide-water. In Bessemer pig, nothing new is reported and $21 full is now quoted. In Spiegeleisen every thing is quiet at $25.50@$25.75, while higher grades are dull at $30.50.

At the Exchange, the following transactions were recorded: Saturday, August 25th, 100 tons American Pig, No. 1, November, $21.87½; 300 tons American Pig, No. 1, November, $21.87½; 100 tons

American Pig, No. 1, December, $22; 200 tons American Pig, No. 1, December, $22; 100 tons American Pig, No. 1, January, $22.12½. Monday, 100 tons American Pig, No. 1, January, $22.25; 100 tons American Pig, No. 1, January, $22.25; 300 tons American Pig, No. 1, January, $22.25. Tuesday, 200 tons American Pig, No. 1, December, $22. Thursday, 200 tons American Pig, No. 1, November, $21⅞; 300 tons American Pig, No. 1, January, $22⅝. Friday, 200 tons American Pig, No. 1, December, $22.

Scotch Pig.—Business during the week has been dull at about our quotations. Arrivals are more moderate this week, and freights are cabled lower, 5s. from Glasgow.

We quote ex ship: Coltness, $23.75@$24; Langloan, $23.75@$24; Summerlee, $23; Dallmellington, $21@$21.50; Eglinton, $20.50@$21; and Glengarnock, $22.50@$23.

At the Exchange, the following slightly lower cable quotations were received: Coltness, 60s. 3d.; Langloan, 59s.; Summerlee, 56s. 6d.; Gartsherrie, 56s. 6d.; Glengarnock, at Ardrossan, 55s. 3d.; and Eglinton, at Ardrossan, 48s. 6d. Warrants to-day were 47s.

Rails.—The 40,000 tons Gowen-Vanderbilt are still in the market, not having been closed as yet. There are occasional small lots at recent quotations, but otherwise the market is very dull.

The low cables of English steel rails have given rise in some quarters to the fear that they might capture the Southern trade. Rails are now delivered along the Southern coast at $41, which is several dollars lower than the figures based upon English quotations.

Old Rails.—There have been sales of round lots at $22.75@$23, but it would be difficult to do better than $23.25@$23.50 now.

Scrap Iron.—There is nothing new to report.

Philadelphia. August 30.

The volume of iron transactions for the past week has been below the expected limits. Consumption is large, however, and stocks are generally of moderate proportions in buyers' hands. Low summer prices have led to but little heavy buying. The temper of the market is not favorable to large movements. The producing capacity is large and fully up to requirements; hence weak prices and cautious movements all along the line.

Pig-Iron.—Very little business was done. Small lots were bought, notwithstanding inferior iron was offered at very low prices. Some makes were offered at $17, furnace; but very little desirable iron can be had below $17.50, while $18.50 is firmly held for three or four of the brands that are mostly wanted. Good Forge happens to be fairly sold up, and buyers keep ordering ahead at about the same figures. Foundry brands are quoted $21@$23 for No. 1; $19@$20.50 for No. 2, with some business at an average of $20@$22. Both buyers and sellers are waiting for developments. There is very little room for any further decline, and producers are rather impatient at the dullness. They believe that, when some cause gives an upward turn to the market, consumers who are holding back for no good reason will rush in and place orders and perhaps lift prices 50 cents to where they ought to be.

Bessemer.—Scarcely any thing has been done in Bessemer, although buyers are ready to buy at their price. Prices have advanced to $21@$22 nominally, according to size of lot wanted; but best offers in a large way are under $21. Spiegeleisen has strengthened itself, but no sales can be reported. Quotations, $31.50@$32.

Blooms.—Small lots are inquired for at $48 for anthracite and $58 for charcoal. Sales of Muck Bars have been made in a small way at $34.

Merchant Bars.—But little has been done, and buyers are looking for a further decline. Iron has been bought as low down as 2·05c. Small lots of best makes 2·20c., but 2·15c. would command good iron. There seems to be no regular price. Manufacturers are anxious to get business, and in a good many cases have taken orders at about cost. Skelp is under fair inquiry, and two or three large orders will be placed in a few days.

Nails.—The production is likely to weaken prices. Stocks are not large, but with so great producing capacity prices are easily affected. Car-load lots are quoted at $3, and small lots are going as usual at $3.10@$3.15. Makers think the market will harden up again when September business comes along.

Plate and Tank Iron.—A good many small orders are coming in. The mills have a fair amount of business for September and October. Plate is ordered at 2·34@2·50c. Shell, 3@3·10c. Flange, 4@4·25c. Fire-Box, 5@5·50c.

Structural Iron.—The outlook at the opening of September is encouraging, both as to business on hand and as to inquiries. The railroads are doing a great deal of buying, and building requirements are up to the average. Prices are at their lowest possible limit. Angles, 2·40c. Tees, 3c. Beams and Channels, 3·50c.

Sheet-Iron.—Manufacturers have orders for September and October, and are all working full. For Common, 4@4½c. Galvanized is strong and steady at 45 off list.

Steel Rails.—Negotiations are still hanging fire at $37. Small lots, $38@$38.50.

Old Material.—Tees are offered for shipment at $23@$23.50. Double-heads, $25.50@$26. One small sale.

Scrap.—Selected Yard, $24@$25; No. 2, $23@$23.50; Cargo, $23@$23.50.

Pittsburg. August 30.

Neutral Forge is offered in 500-ton lots at $17@$18. Foundry iron is asked for in 50 to 100-ton lots, but prices named are not low enough. The market is weak, and sellers are now more urgent than buyers. Stocks seem to be accumulating, especially from outside sources. Bessemer iron is under fair inquiry, but no large sales have taken place, because of the high prices for shipment. Muck Bar is quoted at $34; Refined iron is weak at 1.90c., and even less in some cases. There is a strong probability of a shut-down of the nail factories, but some manufacturers think that the September demand will absorb the entire production and enable them to maintain full output at $2.90 rates. Steel rails are $38@$39. Old rails, $23@$24. Scrap iron of all kinds is dull and weak at unchanged prices.

Cleveland. August 30.

The market for the past week shows increased signs of stiffening, consumers taking larger lots and at holders' prices. There is a slightly increased activity in general foundry trade and a decidedly better feeling among mills. Soft foundry and silvery irons are scarce and in large demand, and good brands of strong foundry iron are not any too plentiful. With prospects of a good fall trade, we look for continued better condition of the iron trade. We quote:

No. 1 Bessemer	$21.50@$22.00
No. 1 Foundry, all ore	21.00@ 21.50
No. 1 Foundry, cinder mixture	20.00@ 21.00
No. 1 Soft foundry	21.00@ 22.00
No. 1 Open silvery	19.50@ 21.00
Mill irons	17.50@ 19.00
4 months. f. o.b. cars furnaces.	
Nos. 1 and 2 charcoal	24.00@ 25.00
Nos. 3, 4, 5, and 6 charcoal	25.00@ 27.00
Hanging rock charcoal	24.00@ 27.00
Strictly cold blast charcoal	30.00@ 33.00
4 months. f. o. b. cars Cleveland.	
Bessemer ores	6.50@ 7.50
Hematite ores	4.50@ 5.75

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Aug. 31.

Anthracite.

The circulars announcing an advance on different sizes of anthracite coal have gone forth into the world and have enjoyed their usual wide publicity. For years, there have been only one or two exceptional periods of short duration when the figures on paper have been actualy maintained, but in many instances an increase has had the effect of carrying values up to or near the circular issued a month previous. Judiciously handled announcements of this kind might have been made to produce that effect whenever the situation would warrant it; and it has certainly frequently acted as a stimulant. But, unfortunately, the temptation to use it as such in any case has been too much, and the companies find themselves in the ridiculous position of saying they want more money for their coal without having even a hope of getting it. The views expressed in our last issue have been sustained by the happenings of the past six days. We have not been able to discover that a single buyer has rushed into the market to cover what little requirements he had, and to-day coal is as abundant and is selling as cheaply as last week. The advance is entirely, so far as this market is concerned, a dead-letter. The chief anxiety of those who have coal to place—and there are few who have not—is to find somebody to take it, and no earnest effort is attempted to hold off for higher figures. Of course, those companies which, like the Reading, have a very heavy line trade, are comparatively well situated, as are those who secured a market months ago, by filling up to the best of their ability the best consumers in the market. But those who are naturally favored or have helped themselves do not admire the present state of affairs, which forces them to make concessions far beyond those which they expected to be called upon to make at this season of the year. With the opening of the winter, the market already contracts; and with an abundance of coal coming forward, the tide-water market will be glutted, especially at the present rate of production. The longer buyers wait, the better their position will get, unless the supply is curtailed by stoppage at the mines.

Until now the tonnage has been satisfactory; but it has evidently led to a heavy stocking of all available markets. The work of distribution should soon begin; but the labors of those who undertake this important function will be seriously interfered with if the present double and unreal position of the companies is not abandoned.

It is evident that the movements of the managers are now made exclusively for effect in financial circles. An air of exceptional prosperity is to be given to the interests involved, and to a certain extent this has been accomplished, but only at the expense of discounting the future. The legitimate trade, which has thus far borne the weight, is beginning to stagger under it seriously. Production and prices both can not be maintained.

Bituminous.

The trade drags along, with prices at low figures. In the Clearfield region, cars are getting a little scarcer.

Horsford's Acid Phosphate.

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